

# *Aquaculture Technology*

## *FISHFARMING & EQUIPMENT*



*Consulting – Production – Marketing*

# INTRODUCTION

## Imprint

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# INTRODUCTION

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# INTRODUCTION

## Approved range of products for aquaculture

The requirement and demand for fish and seafood continually rises worldwide, and the products are steadily becoming scarcer and scarcer. Aquaculture is a young, innovative part of economy with high growth rates and secured prospects.

The future of fish production requires water to be used as economical as possible and environmentally safe removal of waste products with lowest possible energy consumption. Demands of environment legislation reduce possibilities of open water fish production more and more. Already existing fish farms are confronted with directions for purification of their waste waters. This accelerates the development of intensive, water saving systems for fish production which do not depend upon natural environmental factors. The production in closed water systems offers more a compact growing environment for fish, low shared personal costs and good profits. In such systems the waste water, which is loaded with metabolic by-products, is recycled through biological and physical purification and more than 90 % re-used.

Through improvement of the technique we are able to offer very efficient, easy and cost effective systems for fresh- and seawater. Risk minimization, process control and fish health are factors considered in our designs and developments, therefore our systems are usually produced in compact and module construction. Depending on system size and customer wishes our systems will be supplied with modern measuring, regulation and security technique as well as working accessory. During our long time work and experience in fish farming we came to know how important it is to have secure, stable, save and effective devices and equipment. This knowledge finds his display now in our systems, machines and accessories. Beside the development and construction of new devices and units, our systems are tested and approved for several years. Some of our systems are produced by us - other components are also supplied from cooperating business partners.



We offer a complete program for aquaculture from the supply of single components like: incubating-, holding-, feeding-, aerating-, and filtering-systems to complete hatchery, growing and processing systems suitable for many species.

If preferred we can also offer a complete service – from consulting and planning to training and marketing etc.

On the following pages you will find a small selection of our approved range of products for aquaculture and fishery.

Now you can also use our long time experience and know how to secure your success. Please let us know if you have any special question or request.

We would be pleased to hear from you,  
Sincerely

Fischzuchtmeister  
Martin Hochleithner

# HOLDING



# HOLDING

## Recirculation systems for nursing and holding

These modules are available for a yearly production-capacity of 1-2 t/year (125-250 kg standing crop) and allow our customers to get familiar with the technique and topic without high risks. They consist of 2 holdings- and 1 filter-tank with the needed technique and equipment.



The water from the fish tanks is cleaned through a swirl separator and thereafter by filter brushes to remove suspended solids prior to bio-filtration. The bacterial settlement for nitrification will develop on the packages of the reactor - mud will be removed through the current. Our bio-reactors have the large settlement-area of over 900 m<sup>2</sup> per cubic meter filter material and therefore we need only very small filter units. Through the introduction of fine air bubbles through a special aeration- and lift construction our systems work without pumps and therefore require less energy thereby reducing costs. Through compact construction, our systems can be installed any time and anywhere without rebuilding or extension expense.

## Recirculation systems for the intensive production

These modules are available for a yearly production-capacity of 50 t/year (standing crop) onward and can be planned to the special requirements of our customers.

The water from the fish tanks is cleaned through a drum filter to remove suspended solids prior to bio-filtration, where the nitrification process and aeration takes place. From there the water is pumped to the fish tanks, which could be adapted to customer wishes in form, size and number. The use of an UV-sterilizer is possible. This system is available for all fish species (also Salmonids). For the use in seawater the drum filter is changed to a protein skimmer, which is more effective in this case and allows also the economic use of ozone.



For water purification and gas stripping in fish farms, ponds and aquaria we deliver also just the bio-filter media.

The offered material can be used in flow- or trickling-bead filters and has a large surface area from 100 to 900 m<sup>2</sup>/m<sup>3</sup> area to allow a high rate of biological cleaning of about 0.5 g NH<sub>4</sub>-N/m<sup>2</sup> filter media area.



# HOLDING

## Filter chambers with swirl separator

This new compact filters are used specially for holding units and garden ponds and are very effective for the fine and raw filtration. The filter unit can be operated by gravity or by pumps and can be placed into the ground or stands free alone.

A long inlet opening secures that the water in the vortex rotates slowly, so that the larger waste particles are trapped in the centre of the bottom. The build-in flow channels force the water to flow through the filter media (i.e.: Filter brushes, Japan mats, Sinter glass, Aqua rock, Bio balls, Poly foam etc.). The waste particles concentrate at each cone, where they can be removed regularly by opening of a gate valve. The models are made from reinforced glass fibre polyester and are delivered with cover and outlet pipes. They are available with or without filter material.



The following Center-Vortex types are available:

Type	C20	C30	C50	C80	C100
Size L + W cm	85	107	140	165	193
Height cm	65	75	80	100	100
Vortex Ø cm	45	50	75	95	110
In/Outlet Ø mm	110/110	110/110	110/110	110/160	110/160
Flow capacity m3/h approx.	4	6	9	12	16
Pond volume m3 (max.)	20	30	50	80	100

On request also Row-Vortex filters with filter chambers are available.

## Sand filters for high comfort



This sand filters are made of reinforced glass fibre polypropylene or polyester and available in various sizes, heights and types.

The filter units with high performance are available as single systems with or without distribution cross and outlet valve, manometer (with automatic and/or manual air removing) or also complete with pipes and ready for connection (230 Volt/50 Hz) with 6-way backwash valve, self priming filter pump (with large debris collector in plastic) mounted on a noise reducing plate made of plastic. The special filter sand is available as accessory. An automatic backwash system is available for all models and guarantees high comfort and safety.

The automatic heat filter systems are available with electric thermostat, control unit with timer and the back wash system is equipped with a heat exchanger.

# HOLDING

## Drum filters with high cleaning capacity

This drum filters for the mechanical cleaning of medium to heavy loaded aquaculture or industry waste waters are made from stainless steel and are supplied complete with filter frames and screens, cleaning pump, electric control unit and with or without installation tank. They are available with filter screens from 20-100 µm. The water demand for cleaning is 0.13-1.10 l/s at 2.5 bars.



Types with following filter flow capacities (at max. 25-10 mg/l in suspension), are available as standard:

Type	2-60	2-80	4-80	6-120	9-120	12-160	16-160	20-160	24-160	28-160	32-160
Diameter cm	60	80	80	120	120	160	160	160	160	160	160
Filterplates	2	2	4	6	9	12	16	20	24	28	32
Filterarea m2	0.52	0.86	1.72	2.58	3.87	5.16	6.88	8.60	10.32	12.04	13.76
Motor Watt	180	180	250	250	250	370	370	550	750	750	750
Capacity at 30 µm	7-14	13-23	26-46	41-70	60-102	80-140	112-184	135-230	165-280	190-330	215-380
Capacity at 40 µm	10-15	18-26	36-52	54-82	82-123	110-170	146-222	185-280	225-330	255-390	290-450
Capacity at 60 µm	15-20	25-34	50-68	76-105	116-155	150-210	200-280	255-350	300-420	350-480	400-550
Capacity at 80 µm	19-22	32-38	64-76	92-111	144-180	196-244	250-310	320-390	385-470	450-550	510-640

## Protein skimmers for aquaculture and aquaria



These protein skimmers have a good dimensioned volume of the reaction- and foam tube. A special injection unit generates a vacuum, where air is sucked in and distributed in fine bubbles. In seawater the single bubbles have a volume of 0.065 mm<sup>3</sup>, a surface of 0.785 mm<sup>2</sup> and a diameter of 0.5 mm. Each liter air generates therefore a total surface of 12 m<sup>2</sup>. A rotating (patented) nozzle system cleans the foam tube and the foam collector. Over a valve (optional automatic) water cleans the nozzle systems. A regulating system allows operating the skimmer also under extreme differing situations of water column.

The following types are available:

Type/Diameter	250	300	500	700	850	1000	1200	1500	2000	2500
Volume m3	0.07	0.10	0.27	0.63	1.40	1.90	2.71	4.30	7.50	11.70
Height m	2.3	2.3	2.3	2.6	3.6	3.6	3.6	3.6	3.6	3.6
Air suction m3/h	1.2	0.9	5.0	7.7	11.0	15.0	22.0	35.0	75.0	115.0
Power kw	0.35	0.35	0.75	0.85	1.40	2.80	3.60	4.20	11.40	14.55
Flow rate m3/h*	2	3	8	19	40	56	81	125	226	350

\*The flow rate is calculated at an optimal retention time of 2 minutes.



# HOLDING

## Heaters and Chillers for liquids

This compact (CE-certified) heating and/or cooling systems can be used for various liquid media (also seawater or foods) and are very save and secure in operation through the missing direct contact to the media. An electronic control via a high precision thermostat and the continuous display of the temperature via a digital thermometer allow an easy and exact control of the temperature. An ecologic cooling gas (R 134 a) and a low power consumption are features of this transportable and easy to install systems. The standard connection is 230 Volt 50-60 Hz. Systems with integrated UV-C system, or other voltages on request.



The following types are available as standard:

Type/Model	10	15	20	30	60	120
Power Watt	250/400	400/400	650/400	850/800	1400/1200	2400/2000
Connections Ø mm	16/20	16/20	16/20	20/25	20/25	25/25
Weight kg	15	18	20	42	50	60
Dimensions (LxWxH) cm	45x27x40	45x27x40	45x27x40	60x39x56	60x39x56	82x51x70
Capacity (at 25 °C) Liter	500	1000	2000	3000	5000	9000

## Water disinfection with ultra-violet light



Ultraviolet light (UV) destroys micro organisms by changing their genetic information (DNA), but does not produce residual or hazardous by-products, nor does it affect the taste, odour or colour characteristics of the treated water. It is light with very high energy levels and wavelength of 200-400 nanometers (nm). The most effective ultraviolet light for disinfection is UV-C (200-280 nm), specially with a wavelength of 254 nm.

The heart of the UV-systems are high-performance spectrothermal lamps which provide a stable UV output through a wider temperature range and have a higher degrees of effectiveness and stability than other conventional lamps. They also exhibit a high UV power output (up to three times more than competitive low pressure lamps) and long operating live (12,000 h). The efficient lamps have a high UV emission in the area of the effective wavelengths (254 nm), that makes it possible to destroy more than 99.99 % of all pathogens in water. Electronic controllers containing smart chips are designed specifically for the lamps and increasing effectiveness. By studying various reactor geometries with respect to the UV intensity distribution and hydraulic characteristics, specific reactors types were developed to provide disinfection for up to several m<sup>3</sup>/h. The control panel measures important operating parameters such as UV intensity (mW/cm<sup>2</sup>) in the water. Alternatively, the UV dose (mJ/cm<sup>2</sup>) can be calculated and displayed if a flow signal is provided.

# HOLDING

## Polyester tanks in all forms, sizes and colours

These long (over 30 years) proven tanks are manufactured of layers of Glass fibre Reinforced Polyester (GRP) which is absolutely stable against unaffordable climatic conditions or UV. The conical form and funnel shaped outlet and absolutely smooth inside finish ensure the system is practically self cleaning. Therefore it is possible to hold sensitive bottom fish or fish larvae. The whole tanks and especially the edgings are made very strong, allowing attachment of automatic feeders or other equipment. Optional laminated feet make it possible to place the tanks safe on any bottom and ensure easy lightweight handling or transportation.



Circular tank



Square tank



Rectangular tank

The tanks are available in different forms and sizes, and are available in all colours of the RAL-scale. The outlets are made from PVC - pipe with water level regulation, which is fixed under the bottom and leaded at the tank side.

As accessories bottom grids and stand sieves are available.

## Circular pools with liner



These pools can be placed in or on the round and consists of a 0.6 mm strong galvanized iron wall which is painted inside and plastic covered outside. The lower and upper bottom- and hand-rails are made of strong plastic to ensure a long life. Inside the pools are lined with a 0.8 mm strong PVC liner with exact fitting in black colour (on request also in blue).

Optional bottom protection pillows (5 mm) are available.

Some of the available sizes:

Volume	Diameter	Height
1600 l	2.0 m	0.6 m
2600 l	2.0 m	0.9 m
5700 l	3.0 m	0.9 m
7800 l	3.0 m	1.2 m
10600 l	3.5 m	1.2 m

If preferred we deliver also just the robust and soft PVC pond liner in a thickness of 0.5 to 1.5 mm in the colours black, green or blue, on coils with a wide of 2-8 m and a length of 15-50 m, or as finished liners in any size.

## BREEDING





# BREEDING

## Vertical incubators for Salmonid eggs

These vertical incubators for the professional breeding and hatching of eggs and fry can be combined and arranged in various ways, to utilize the water and space as effectively as possible.

The water (min. 2 liter/minute) from the inlet, flows through the trays on which the eggs stays, and leaves the water tray over the front during the side canals to the next tray, where it flows again through the egg tray and so on, so that all trays will be supplied with sufficient water. Without disturbing the other trays, each tray can be drawn out and controlled easily. These incubators guarantee the safest rearing conditions and are available with 4-16 trays approx. 60 x 60 cm (for about 50,000 to 200,000 eggs) made from strong non toxic plastic material and includes the aluminium frames and all egg trays (approx. 50 x 40 x 4 cm) with PVC coated polyester screens. Optional isolation panels (clear or black), and tray segregation baskets are available.



Types with the following characteristics are available:

Type/Trays	4	8	12	16
Egg capacity liter	4	8	12	16
Height cm	44	86	137	176
Weight kg	23	45	68	90

## Troughs with incubation baskets

For easy incubation with a good overview this breeding troughs are used worldwide for Salmonid eggs like: salmon, trout, char, and grayling etc.

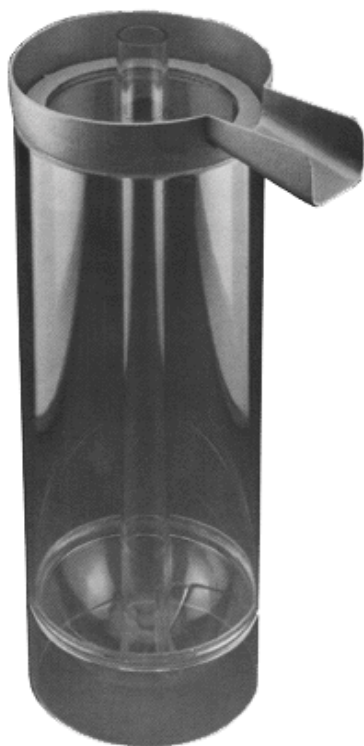


The troughs are made with high quality of glass fibre polyester and completely smooth on the inner sides and therefore easy to clean and disinfect. They are available in two sizes (length 215 and 360 cm) for 4 respectively 7 incubation trays) and have a width of about 40 cm, as well a height of 17 cm. The incubation trays with a size of 40 x 40 cm fit exactly.

Because of a new production technique, the stainless steel screens (with 1-2 mm holes), are perfectly inserted into the trays and allow a constant flow. Each tray has an incubation capacity of up to approximately 10,000 to 20,000 eggs (1-2 liter). To use the trough after incubation also for start-feeding, a screen which fits exactly is available as accessory.

# BREEDING

## Hatching jar made from plastic



Used successfully for over 20 years by federal, state and professional hatcheries and fish producers here and abroad, this jar can be used for a wide variety of species like: Salmonids, Acipenserids, Percids, Silurids, and Cyprinids etc. Made of high impact, non-corrosive easy to clean plastic (Plexiglas), this uniquely designed hatching system enables uniformly distributed water to rotate fish eggs ever so gently and evenly. It works very simply as water from the supplying hose is directed down to the open-ended feeder tube in the centre of the jar. The tube (3 cm Ø) easily accommodates the preferred water flow so that the eggs at the base are rotated uniformly and precisely. The jar has a height of 46 cm a diameter of 16 cm and a volume of nearly 7 liter. It weighs only 1.1 kg and is delivered complete with feeding tube and screen. The circular filter/mesh screen prevents eggs from spilling out of the jar, while the large spout (length 7.5 cm, width 5.0 cm) at the top lets hatched fish swim out at just the right time. Now you can virtually duplicate nature's way of hatching eggs with this durable, clear incubator jar.

## Zuger jar system made of stainless steel

These systems are made of stainless steel and are equipped with glass jars which can be removed and supplied separately. Through the inlet tank, all jars can be individually supplied with water.

The system can be equipped with a heating-/cooling system and in connection with an UV-sterilizer to be operated in recirculation.

The standard system has 3-7 jars each with a volume of 8 liters, and dimensions L x W x H of about 80-200 x 40 x 165 cm.

Other dimensions or jar volumes are also possible, depending on customer design.

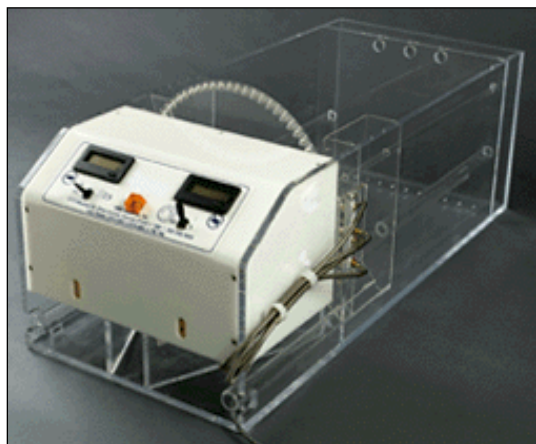
Single jars with or without support-stand in stainless steel are also available.



# BREEDING

## Automatic sorting machine for salmonid eggs

This egg sorting machine uses the most current technology to sort 100,000 eggs per hour. It is available with both live and dead egg counter or also without counters. It has dimensions (L x W x H) of approx. 78 x 35 x 27 cm, a weight of 23.5 kg, and an egg tank capacity of 19 liters and is made of clear and white acrylic plastic.



Using the patented standard disk, the egg sorter will sort Salmonid eggs from 5,000-18,000 per kg, or if equipped with the salmon disk, it will sort any size salmon egg. Best of all, you never have to change disks to handle different sizes of eggs. The patented technology uses fibre optics and modulated infrared light to scan the egg and assure the highest level of accuracy (approx. 98-99 %). It has been used around the world and will accommodate any local voltage, which is reduced to 12 V DC in the interest of safety.

Eyed eggs are placed in the trough with water flowing through the bottom. Several kilograms of eggs may be loaded at one time. The water flushes the "eyed" eggs against the patented disk where they are captured in the tapered holes in the outside of the disk. Once the egg sorter is fitted with the disk matching the type of egg you are sorting (trout or salmon) it will sort any size egg inserted. The eggs in the disk then pass an electronic scanning device which, using modulated infrared light, detects dead eggs. All with 100 % ambient light immunity. Dead eggs are then ejected out one side of the sorter while the live eggs travel to the opposite side where a gentle flow of air ejects them into a curtain of water which carries them to a separate container - safe, sound and ready for further incubation. The counters then increment, providing accurate totals of both live and dead eggs sorted. Each time a dead egg is detected, a light comes on giving you visual assurance that everything is working correctly.

## Manual sorting device for salmonid eggs

Formerly, developed at the Austrian Institute of Fisheries Economy, this handheld egg-sucker has been rebuilt, allowing selecting dead Salmonid eggs now fast and easy.

The pistol-formed device has to be held at the handle with one hand, with the other hand the suction ball has to be pressed until the unit overflows at the tube end. Now, each egg can be advised with the suction pipe and if the button at the handle is pressed, it will be sucked into the Plexiglas collecting unit. With some experience, it is possible to work with this device fast and exactly.





## FEEDING



# FEEDING

## Automatic feeders for dry-food

These "Solaris" feeders are designed and constructed to the latest specifications in the field of aquaculture economics by using the most modern components of present day technology.

The model "STANDARD" is delivered with a (600 mA) solar panel, which supplies a motor with the needed energy. This feeds without battery, without electronic, (some seconds, some seconds pause) from sunrise to sunset (also on rainy days). The daily feeding amount (of the 1-5 mm pellets) is adjustable from 0.1 kg up to 100.0 kg/day.

The model "INTERVAL" is additionally equipped with a feeding computer and accumulator (to balance weather depending days) who are mounted in a splash proof box (directly on the feeder) below the larger solar panel, and can be adjusted exactly to feeding intervals, feed amount and time.

The model "SUPERSPREADER" is additionally equipped with an adjustable sector and round spreader (radius adjustable approx. 2-8 m and up to 20 m on request), and delivered with a larger solar panel.

The model "UNIVERSAL" can additionally be used for flake feeds, seeds and pellets up to 12 mm in size.



The white or green feed hoppers are available in five sizes (with a volume of 15, 25, 45, 75 or 95 liter). As accessories a tube or ring holder hopper support is available.

Optionally we deliver a holder construction to fix the feeder on land or a floating construction to put the feeder on the water surface.

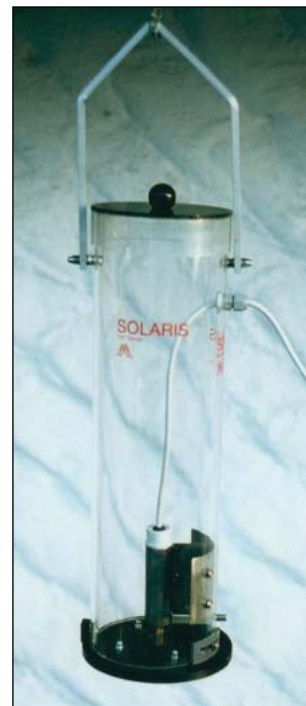
All models are also available without solar panel, accumulator and timer, for the connection to a central power supply for an available control box with timer and transformer (for 1 respectively up to 8 or 24 feeders).

# FEEDING

## Electric feeder for fry

The model "HATCHERY" is also available for this central timer and distributor box. It is a disc-feeder with a 2.5 l volume feed cylinder and was developed for feeding the finest fry food up to 2 mm pellets in the hatchery.

The feeder is suspended above the fry tanks, thus allow you to have sufficient space to work. Power supply is provided via a control box equipped with a (220V AC/12 V DC) transformer and a timer. The beginning (i.e. morning) and the end (i.e. evening) of the feeding period are set on the timer. The distributor box automatically sends a pulse which switches the motors of all (up to 24) connected feeders on simultaneously for a short time to move the conveyor disk(s). The interval between pulses is infinitely adjustable from 0.1 second to 10.0 hours. For individual feeder dosage, the slot between conveyor disk and the Plexiglas cylinder can be adjusted. For this purpose, slacken the adjustment screw (turn counter clockwise), turn the conveyor disk clockwise (the slot becomes smaller), or turn it counter clockwise (the slot becomes wider), and finally re-tighten the adjustment screw.



## Pendulum feeders for self service

For an easy self service of the fish, pendulum feeders are used since some decades. With simple pendulum feeders there falls usually too much feed out of the hopper, which not only pollutes the water but also costs money. Therefore we have refined these new pendulum feeders with some technical changes (i.e. a disc), where the feed does not directly fall out of the hopper and therefore allows a better adjustment and controlled feeding.



The model "PENDULUMFEEDER" is a self feeder for 1-5 mm pellets with a disc. When the fish touch the pendulum, the feed falls from the disc directly into the water. The slot between feeder and disc can be adjusted.

The model "PENDULUMSPREADER" is a self-feeder for 1-5 mm pellets with solar panel, which continuously operates a spreader disc. When the fish touch the pendulum, a part of the feed falls directly into the water and a part of the food on the adjustable spreader disc which spreads it over a distance of up to 8 m (sector spreader).

The white or green feed hoppers are available in five sizes (with a volume of 15, 25, 45, 75 or 95 liter). As accessories a tube or ring holder hopper support is available.

Additionally we supply pneumatic feeders for feeding areas (up to 10 m<sup>2</sup>).



# FEEDING

## Belt feeders with strong clockwork

Since more than 30 years this feeders are in use for save and exact feeding of fish fry and fingerlings. The clockwork runs (up to 12 or 24 hours) and is started if the belt is returned (in the morning) where the feed (up to 3-5 kg) is placed. The new clockwork with strong and corrosion free steel spring and splash proof acryl cover as well the plastic box lasts best the weather conditions and guarantees a long self live of the feeder. The feeders are available in 2 sizes and have dimensions (L x W x H) of 560 x 200-300 x 150 mm and can easily used at any place without electric energy, like ponds.



## Automatic feeding device for frozen zooplankton

20 years worldwide experience in the field of plankton research, catch and larval feeding was the basis of the new "Plankton feeder", which was developed in cooperation with the Institute of Fish Research.



This device is designed for the professional application of frozen zooplankton as a larval diet in marine and fresh water hatcheries for the production of high quality fingerlings like: Charrs, Salmons, Snapper, Turbot, Grouper and other species. The technique is based on a timed "wash down" of feed layers from large frozen plankton crumbs (up to 20 kg) and homogeneous distribution of the thawed plankton rations to the larval tanks by a specially developed self cleaning distributor. "Wash down" of the food layers and thawing can be performed either through spraying or by flooding, the remaining plankton is frozen again.

The feed particle size can be adjusted by a special sieving unit. In order to avoid membrane damage and leaching effects of the thawed plankton organisms, the feed is distributed to the (up to 16 or 32) larval tanks by gravity flow only.

If necessary we are able to deliver also the frozen crustacean plankton.

# AERATING



# AERATING

## Injectors for aeration, circulation, oxygenation and de-stratification

These proven injectors are one of the best and most advanced aeration systems worldwide, and also suitable for large ponds.

The injectors work with a for endurance run produced, maintenance free, turn able, submerged (also seawater resistant), motor. The rotating propeller (2800 r.p.m.) produces an adjustable current, through which air drawn from the surface and formed into fine evenly distributed bubbles. The diffused air aerates from the bottom up and the circulation created displaces the surrounding water, thus breaking up stratified water areas. This constant surge forces the pond to turn over, bringing cooler bottom water to the surface, where it picks up additional oxygen from the atmosphere. Therefore the dissolved oxygen content is always as high as possible.



Usually there is an oxygen deficit at depth, therefore this system works to an adjustable depth and introduces the oxygen where it is needed, not only on the surface. If submerged, pure oxygen instead of air can be introduced with exact dosage. Long contact time of the fine bubbles in the water, ensures also this system is very effective. Depending on installation, depth and current, sediments can also be removed. If the aerator is positioned near the water surface it also acts as an ice clearing machine in winter. Strong circulation also eliminates pond stratification and organic matter deposition. Finally thanks to the floatation phenomenon (foaming), this aerators make it possible to remove excess algae proliferation, colloidal substances, mud and any other suspended particles and improve water quality. With this proven system, all variants of aeration, current creation and oxygenation are possible.

Depending on power and depth, the air flow rate is up to 35 m<sup>3</sup>/h. At an oxygen content of 6 mg/l at beginning, one 1.0 HP unit in use with air, introduce over 0.32 kg O<sub>2</sub>/h which is the oxygen demand for over 2600 kg trout (each 250 g) at a water temperature of 10 °C, or for up to 3000 kg of other species at 20 °C.

The aerators are supplied complete with motor (1.1 kw/1.5 HP for 230 V/50 Hz or 1.5 kw/2.0 HP for 380 V/50 Hz), support, floats and propeller protection fingers. They are compact lightweight units (Motor: 10 to 16 kg), and very easy to install.

## Injector without further energy consumption



This "ECO" injector is a static aerator for the water inlet pipe (1 ") in tanks, raceways and small ponds. It is designed to ensure cost-effective use of any available water source, for degassing, aeration and oxygenation, thereby avoiding energy wastage and maximising efficiency. In enriching the water with air or oxygen, it can create good circulation with a lesser amount of water than is usually necessary.

It works hydraulically (from 0.2 bar and 0.4 l/s on) and has no moving parts, by exploiting the act the water passing through it at high speed, achieved by means of suitable flow rates and pressures with the special 3 interchangeable nozzles (for approx. 30, 50 or 100 liter/minute) which creates a pressure drop and consequently a tremendous suction capacity, without introducing additional energy.



# AERATING

## Propeller aerator with horizontal spray pattern

This propeller aerator was specially developed for intensive production of fish in tanks, raceways and ponds. The maintenance free, heavy duty, motor (230 or 380 Volt) has a mounted propeller which allows a high water circulation and has an oxygen transfer rate of approx. 1.5 kg/kwh. The small float size (70 x 70 cm) as well as the compact and lightweight system makes it fast and easy to install.



The following types are available:

Power consumption kw/HP	0.15/0.2	0.37/0.5	0.75/1.0
Water circulation m <sup>3</sup> /h	50	100	180
Water splash Ø cm	160	180	250
Water splash height cm	60	75	90
Weight kg	26	28	30

As accessories protection baskets (with 4, 7 or 12 mm grating) are available, which save smaller fish from injuries. Additionally a water conveyer for the suction of deeper water can be build to specific depths.

## Aerator pump with fountain spray pattern



This "Spray" aerator pump is especially suitable for ponds and introduce a lot of oxygen into the water. If the self floating pump is connected with the spray nozzle it becomes an aerator with fountain spray pattern. If the supplied nozzle is changed to the supplied pipe adaptor it can be used as a floating pump for irrigation. The change of these two functions doesn't need any tool. They have a very reasonable price and are easy to install, either floating on the water surface or submerged to any depth (with an anchor stone).

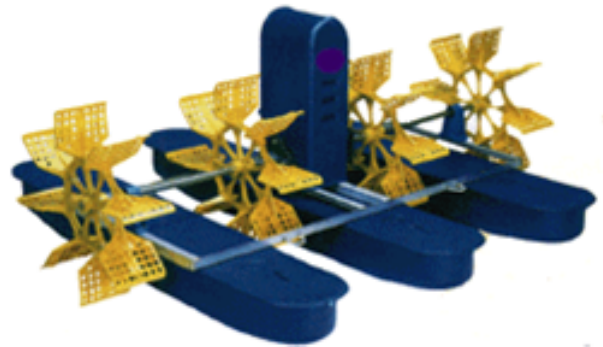
The following types are available:

Power Watt	250	550	750	1100	1500	1800
Voltage (50 Hz)	220	220	220	380	380	380
Circulation m <sup>3</sup> /h	10	20	25	30	40	75
Splash height m	3-4	4-5	6-7	6-7	6-7	3-4
Splash Ø m	3-4	4-6	6-8	8-10	9-11	10-12
Pipe Ø mm	50	65	80	80	80	100
Weight kg	8	14	15	15	16	20

# AERATING

## Paddlewheel aerators for intensive production

This paddlewheel aerators widely used all over the world, speciall in intensive ponds and raceways. They are available with 2-6 paddle wheels, in different power ratings from 0.75 to 2.20 kw (for 220 or 380 Volt/50 Hz) and have a weight of 80-120 kg. The oxygen introduction is usually about 1.6 kg/kwh. Wheel and frame are made of steel, the paddles from special plastic material and the H-formed floats from thick UV- and ozone resistant plastic.



## Paddlewheel systems for effective oxygenation

Aeration and/or oxygenation are especially of economic importance in intensive farms. At these completely new developed systems all possible failures and defects of other known products have been removed. The systems have been tested under hardest conditions and have a very high efficiency, with low operation costs the same time. There are no bearings of the wheel (approx. 140 r.p.m) necessary and also no couplings and discs, this reduce friction lost and increase the efficiency and also reduce the possible parts which could become defect with time. A very long self live and high efficiency is also guaranteed through the worm-gearing. The motor is specially sealed against moisture. Paddles, wheel and frame are made of stainless steel, the floats from thick UV- and ozone resistant material. The oxygen introduction is usually about 1.6 kg/kwh.



Paddlewheel aerator



Oxygen cover

The Paddlewheel Aerators are available in different power ratings (180, 250, 370, 550 and 750 Watt) for standard 380 V (230 V on request) and have dimensions of approx. 1.5 x 1.6 x 0.6 m (L x W x H) and a weight of 30-70 kg.

To use these paddlewheel aerators also with pure oxygen instead of air, a special oxygen cover is available as accessory. The special formed cover inside guarantees that no oxygen (feed up to 15 l/min) disperses or waste to the surface after the water leaves the aerator. As there are no seals necessary this also guarantees that there is no oxygen wasted and thus this makes the system very effective too (up to 90 %).

# AERATING

## Rubber diffusers with stainless steel frame

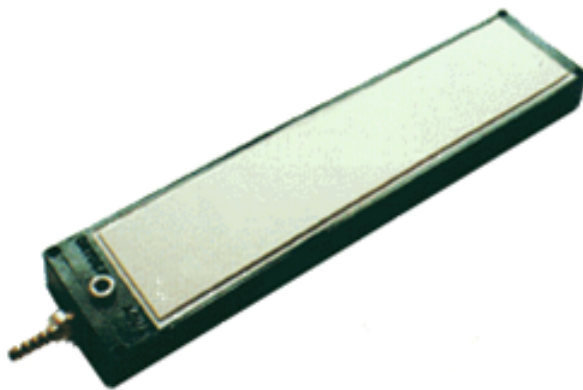
These extremely durable and effective diffusers are suitable for the live fish transport and for emergency purposes with pure oxygen. The approx. 1000 pores/meter arranged in 6 rows, of the special oxygen hose open only if oxygen is supplied and close again if the supply stops. Thus, pore blockage is prevented and the diffuser is always ready to operate. Uniform bubble sizes due to the straight hose mounting in a stainless steel frame are main features of these professional diffusers.



The diffusers are available in different sizes (40-70 x 50-150 cm). Other diffuser sizes and forms on request. The sturdy hose connection is 6 mm as standard (on request also in 9 mm). For the self production of diffusers we deliver also just the diffuser hose per meter (19 mm inside diameter) as well as end pieces with connector and the pressure hose per meter (6 mm inside diameter).

## Ceramic plate diffusers for micro gas bubbles

These diffusers are robust engineered products with high specification and performance and perhaps are the most efficient diffusers available.



The ceramic plate has been designed to be very strong, the thickness (approx. 12 mm) of the ceramic has been increased over the more conventional plates. The pore size is also only 0.3 microns which produces a cloud of tiny oxygen bubbles (10-200 microns) in the water. Depending on the gas (oxygen or ozone) and water chemistry, the diffused gas may pass directly into solution with no visible sign of bubbles. There may be no better gas diffuser available.

The transfer efficiency can approach up to 100 % of oxygen into solution and the oxygen saturation in the water over 120 %. In seawater applications it can actually be difficult to see the bubbles, since the gas goes almost directly into solution.

The ceramic flat plate diffusers give a very small bubble size and are used where a small high rate diffuser with high oxygen transfer efficiency is required. The working gas pressure is 25-35 psi. Do not exceed 50 psi (3.5 bars) as it may result in damage. The diffuser has a weight of 3.55 kg, outside dimensions of 450 x 110 x 28 mm with a ceramic plate of 400 x 90 x 12 mm (360 cm<sup>2</sup>) for a gas flow of up to 6-8 l/min and has a 6 mm oxygen hose adapter.



# AERATING

## Professional ceramic diffusers for air



The fine pored ceramic tubes allow diffusing of air in fine bubbles. The diffusers should be installed in the same depths, but as deep as possible below the water surface. The floating cross diffuser is placed on the water surface in the centre of the tank or pond and fixed with a rope to the shore so that it can move a little and aerate a larger area.

The cross diffusers are available complete with 20 mm hose tail (other on request) and are delivered with or without float. The 1 m long feeding tube is also available shorter. Each ceramic diffuser tube has a length of 18 cm and a diameter of 6 cm and can introduce approx. 1.5 to 2.0 m<sup>3</sup> air/hour each (6-8 m<sup>3</sup> per cross diffuser). They are also available as self sinking single tube diffusers with hose tail.

As accessories air feeding hoses (clear) and distributors with valves are available.

## High performance gas diffusers

This is among the most robust and versatile fine bubble diffuser available. It resolves many of the problems associated with other diffusers and has proven itself with over 10 years of use in many industrial and waste water treatment applications.

The diffuser has the capacity to pass large quantities of air, oxygen or carbon dioxide with low pressure drop and small bubble size (approx. 1-4 mm). Fine bubble diffusion is inherently more effective than coarse bubble diffusers in providing a greater mixing action and aeration efficiency. The diffusers are of a tubular semi-flexible construction (32 mm in diameter).

An outer polyester sleeve encases silica particle ballast and an inner nylon distributor. The internal ballast is not fused together, therefore precipitates such as iron and carbonates tend to crack off, and can be flushed out easily. The internal ballast (weight approx. 1.6 kg/m) means that the diffuser does not need to be anchored to the ground. The unique design of the diffusers makes them largely resistant to biological and chemical fouling.



The diffusers are sized (up to 5 m in length) according to the flow (m<sup>3</sup>/h) of air to be used. Length is approx. 33 cm per m<sup>3</sup>/h air or liter oxygen/min flow rate and pressure drop is less than 1 psi. All diffusers are supplied with either 3/8", or 1/2" hose tails in acetyl plastic. Brass or stainless steel fittings are also available.

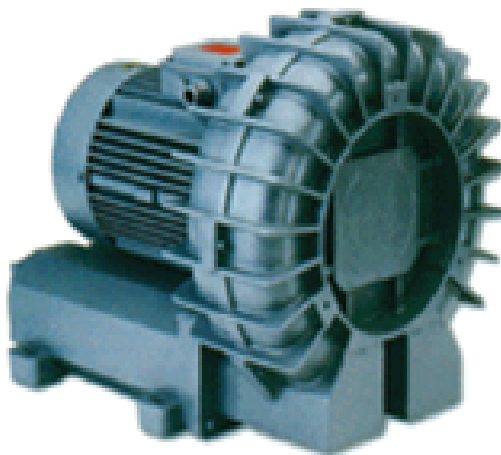
Additional diffusers in different forms (disc or tube), sizes and materials, on request.

# AERATING

## Regenerative blowers for pressure or vacuum generation

These reliable and favourable blowers summarise modern know-how of pressure and vacuum generation, based on long time experiences.

The motor is constructed for endurance run. Because of the compact dimensions and the low sound these blowers are easy and everywhere to install. Lateral channel blowers work regenerative. Casing and impeller with radial blades form a circular body. The medium (air) is accelerated by centrifugal force in the blade channels, stocked and compressed. This process continues permanently with continually increasing pressure rising until the medium leaves the casing through the outlet connection. The special principle of construction and design, guarantees no contact between rotating parts.



As accessories air filters, sound absorbers, and non return valves are available. Types with the following performance data\* are available as standard:

P mbar	0	50	100	150	200	250	300	350	400	450	500	550	600
Type-single stage (kw)	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h
06-SH (0.20)	55	29											
V3-SH (0.37)	70	50	31										
30-SH (0.75-1.50)	124	109	94	78	64	49							
40-SH (0.75-2.20)	204	172	145	120	99	80	64						
45-SH (1.10-3.00)	249	215	182	148	114	78	37						
50-SH (2.20-5.50)	319	286	256	230	204	180	156	113	110				
60-SH (2.20-7.50)	393	362	335	308	283	260	235	210	185	160			
65-SH (2.20-5.50)	527	468	414	365	316	266	218						
70-SH (3.00-7.50)	522	477	433	389	350	310	273	235					
80-SH (4.00-15.0)	834	778	714	655	602	550	497	445	393	341			
90-SH (5.50-15.0)	1084	990	900	820	743	667	592	515	440				
Type-double stage (kw)	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h	m3/h
10-DH (0.37)	30	23	15	9	2								
15-DH (0.55)	50	44	37	31	25	20	14						
20-DH (0.37-1.10)	72	62	51	43	35	28	22	17					
30-DH (0.75-1.50)	103	90	79	70	61	52	43	35	26				
40-DH (0.75-3.00)	144	131	118	106	95	84	73	64	55	46	37		
50-DH (2.20-4.00)	182	168	149	137	127	118	110	103	97	90	84	78	
65-DH (2.20-4.00)	269	242	220	201	184	170	156	143	127	112			
70-DH (2.20-7.50)	276	259	240	226	215	202	193	183	173	164	154	145	136
80-DH (4.00-9.00)	430	410	387	371	355	341	326	313	300	287	273	261	250
90-DH (4.00-11.0)	546	510	495	472	450	430	410	391	372	353	333	315	300

\*At pressure operation 50 Hz (= 2900 RPM), at 15 °C, weight 1.23 kg/m<sup>3</sup>, 1013 mbar, +/- 10 %.

# MONITORING





# MONITORING

## Professional microprocessor meters



All these electronic devices have a size of 142 x 71 x 26 mm (L x W x D) and a weight of approx. 155/255/300 g (incl. battery/sensor), and have a LCD double display (precision:  $\pm 1$  digit) for measured values and temperature, min-/max-value memory, configurable automatic switch-off function (1-120 minutes), hold-function, foil pushbuttons, automatic temperature compensation, 12 mm  $\varnothing$  sensors, serial connection, 9 V battery with warning and external energy connector as well as integrated stand- and hanging clip.

All meters are also available with integrated alarm- and logger function with real time clock and date.

Transformer and transport case are available as accessories.

The following meters are available:

### GMH 33 Flow Meter

Measurement: Flow 0.05 - 5.00 m/sec  
Option: Humidity 0 - 100 % rH;  
Temperature 0 - 60 °C;  
Outfit: Sensor with 5 m cable and connector.  
Wind measurement on request. Telescope sensor on request.

### GMH 34 Conductivity Meter

Measurement: Conductivity 0 - 2000  $\mu\text{S}/\text{cm}$ ;  
Temperature 0 - 85 °C;  
Option: Salinity 0 - 70 mg/l;  
Resistance 0.005 - 100.0 kOhm; 0 - 1999 mg/l (TDS)  
Outfit: Sensor with 1 m cable fixed to the meter.  
Automatic conductivity measurement in the optimal range.

### GMH 35 PH-value Meter

Measurement: pH-value 0.0 - 14.0 pH;  
Temperature 0.0 - 60.0 °C;  
Option: Redox (ORP) -1999 - +2000 mV,  
Humidity 0.0 - 70.0 rH;  
Outfit: Sensor with 1 m cable and connector.  
2-point automatic or manual temperature depending calibration.

### GMH 36 Oxygen Meter

Measurement: Oxygen 0 - 30 mg/l (ppm), 0 - 200 % (sat);  
Temperature 0 - 50 °C;  
Option: Air-Pressure 0 - 1200 hPa (0 - 900 mmHg) 500 - 1100 hPa abs.  
Outfit: Sensor with 4 m cable and connector.  
Manual pressure and salinity compensation (automatic with option).

As accessories for GMH Meters with alarm function a switch module with a switch potential of 10 A for the supply via 220-240 V, 50-60 Hz connection (incl. transformer for meter) with each approx. 1 m cable is available.

In connection with a PC, a meter of the GMH-type, the PC-interface adaptor and a software (accessories), also a comfortable and reasonable data collecting system can be built (registration of data also over many years possible).

# MONITORING

## Graphic microprocessor meters

This "OxyScan" micro dissolved oxygen meters are specially developed for the use in aquaculture and limnology. Through the very stable splash proof cover made from ABS plastic and the delivery including plastic transport case as well as the plastic sensor (14 mm Ø, 150 mm long with 2 m cable and connector) with a very long sensor life (approx. 2 years standby time, physically) they are perfect for field work. The large full graphic display makes the result clear and fast visible. The short polarisation time (approx. 30 sec. max. 5 min.), the low flow current sensitivity (1 % at 5 cm/sec.), high precision +/-1 digit (0.1 mg, 0.5 % or °C), as well as the air-pressure and temperature compensation in the range of 5-40 °C makes working easy. The automatic calibration with the included calibration chamber is an additional feature. A free-configurable switching output (24 V DC / 2 A or 230 V AC / 1 A) and exact analogue output or an extended measurement range (up to 199.9 mg/l) are options for all these meters. These meters can also be configured as you wish, e.g. storage, specific control-logic (with switch outputs), customer-specific data format, but it is also possible to extend this system anytime. As options are also available: stainless steel sensors 4.7-5.4 mm Ø, 80-400 mm long with 1.5-5.0 m cable and connector (other cable lengths on request).

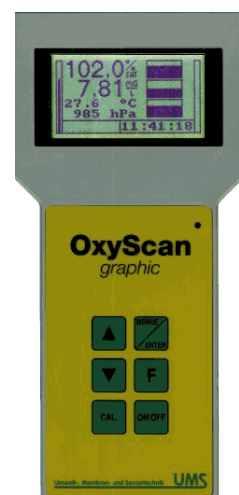
### OxyScan "light"

- Measurement: Oxygen (0.0-19.9 mg/l and 0.1-199.9 %sat);  
Temperature (0.0-50.0 °C);
- Display: Large full graphic-display with 120 x 32 pixels;  
Memory function for up to 50 single-values,  
displayed directly on the display as diagram or single values;
- Outfits: Manual atmospheric pressure compensation;  
Standard (9 V DC) battery for approx. 500 h;  
Battery warning on the meter;
- Options: RS-232 interface for transmitting to PC, notebook or printer;  
Connector for power supply with (8.2 V DC) accumulator;



### OxyScan "graphic"

- Measurement: Oxygen (0.0-19.9 mg/l and 0.1-199.9 %sat);  
Temperature (0.0-50.0 °C);  
Air Pressure (150-1150 mbar);
- Display: Huge full graphic-display with 128 x 64 pixels,  
diagrams show the last 30 values;  
Memory function for up to 4000 serial-values,  
displayed directly on the display as diagram or table;  
Measurement intervals from 2 seconds up to 10 minutes,  
starting time and date to set;
- Outfits: Automatic atmospheric pressure compensation;  
NiMH-accumulator, 2100 mAh (Operating time >24 hours);  
Inclusive fast-charger (charging time about 4 hours);  
Battery monitor on the meter;  
Memory keeping (memory active up to 6 months,  
depending on the measurement period);  
Real time clock with date function;
- Options: Wireless infrared-interface for connection with infrared units;  
Infrared-receiver with RS-232 adaptor for non infrared units;  
Single value memory function;  
Illuminated display (backlight);  
PH-value and Redox-potential measurement;



# MONITORING

## Saturometer to identify gas super-saturation



Gas bubble disease is often present undetected and leads to significant damage in the fish stock. If fish are being exposed to over saturation continuously, they will suffer from it no matter which gas contributed most to the super saturation!

This new handheld saturometer (Protection class IP65, with electric backlight display identifies gas super-saturation in water reliably to 400 hPa resp. mbar pressure difference, with an accuracy of 1 hPa. It works with a usual 6 x 1.5 V Lithium cells, with integrated capacity monitoring on the meter. The maintenance free sensor is completely sealed (Protection class IP67, Signal output 0-5 V). As option also an oxygen sensor can be connected to the meter.

In experiments it was proven, that a continuous charge with only low levels of super saturation has a significant negative impact on the fish immune system. A fish stock infected with IPN (Infectious Pancreas Necrosis) produced losses of 10-15 % after 90 days whereas fish from the same stock exposed to super saturation showed a mortality rate of 65 %. The gas bubbles themselves cause a lot of direct damages like lesions and embolies. Those alone are lethal in some cases. But in every case they open the door for secondary infections which can not be repelled by a weakened immune system. Another typical sample is a trout breeder who reported fin rot and fungus (Saprolegnia) on the fish body. Measures showed a gas pressure of 45 hPa which equalled to 105 % gas saturation. It may not sound high but the pectoral fins were severely damaged by gas bubble lesions. The fin rot and fungus (Saprolegnia) were clearly produced by an undetected gas over saturation.

## Waterproof pocket testers

This waterproof (IP67) and pocket sized testers (153 mm long, 24 mm diameter, and weight just 45 g) with digital display are ideal for aquaria or aquaculture and any other field applications. There are different models with replaceable electrode and automatic temperature compensation available that read conductivity or salinity (0-1999  $\mu$ S EC or 0.0-199.9 ppm TDS), pH-value and temperature (0.00-14.00 pH and 0.0-50.0  $^{\circ}$ C) or Redox-potential ( $\pm$ 1000 mV ORP) at an affordable price.



The testers are factory calibrated, but can be manually calibrated and measurements are highly accurate (0.1 digit or 2 % or mV) with high resolution (1.00 to 0.01). The modular design allows easy electrode and battery replacement. A rugged splash-proof and floating casing prevents water infiltration. All the testers work with common batteries (3 x 1.5 V) and have a long live.



# MONITORING

## Photolyser for various water parameters

For the necessary analysis of waters, this microprocessor photometer with professional concept and high precision is the right choice.

To start analysing, the required program on the foil pushbuttons is selected. The display shows the parameter and dimensions exactly (to 2 digits behind the dot). An acoustic signal informs when the reaction time is finished. The results are displayed on the meter and can be stored for later processing. The meter is equipped with an RS-485 adaptor. Via an additionally integrated RS-232 adaptor the meter can be connected to a printer or PC (cable as accessory available). It is possible to archive over 500 stored data sets with date and time for up to 16 tanks.



The meter has a 0-point-memory, which needs no new calibration. This digital photometer works with 4 usual 1.5 V DC batteries, with integrated capacity monitoring on the meter. Alternatively accumulators or a connector for external power supply are available (as accessories).

### Possible Regencies/Measurements:

Aluminium 0-0.5 mg/l, Ammonia 0-0.5 mg/l, Bromine 0-10 mg/l, Chlorine 0-5 mg/l, Chloride 0-250 mg/l; Copper 0-1 mg/l, Hardness 0-500 mg/l; Iron 0-5 mg/l, Manganese 0-0.03 mg/l, Nitrate 0-100 mg/l, Ozone 0-1 mg/l, Phosphate 0-4 mg/l, pH-value 6-8 and Acid-potential 0-5 mmol, etc;

## Chemical test box

This compact laboratory box set is equipped with liquid colour analysis tests for: Oxygen (Demand + Dissolved), Hardness (Total + Carbonate + Residual), pH-value, Ammonia, Nitrite, Nitrate, Phosphate, and Temperature.

All tests are also available as single or replacement units and additionally test sets for: Aluminium, Arsenic, Lead, Chlorine, Chloride, Cyanide, Iron, Calcium, Copper, Magnesium, Manganese, Nickel, Sulphate, Sulphite, Zinc, Zing and much more.



# MONITORING

## Multichannel system for control and management

This very versatile instrument can be used as a stand-alone wireless and solar powered multi channel controller for cages, ponds, tanks and raceways, etc. If there are more than one transmitter units and a base station receiver, then the system automatically configures as a network and sends the information by low powered wireless communication to the base station. This makes for a really low cost simple system and for the first time provides a package ideal for cages, ponds or for any installation that can not use wires. In the event that you get hit with lightening, then generally only one unit will be affected, and if it can not be repaired on-site then you simply send the faulty unit back and replace with a working unit. This means that you are in control of your own system and not dependent on service engineers.



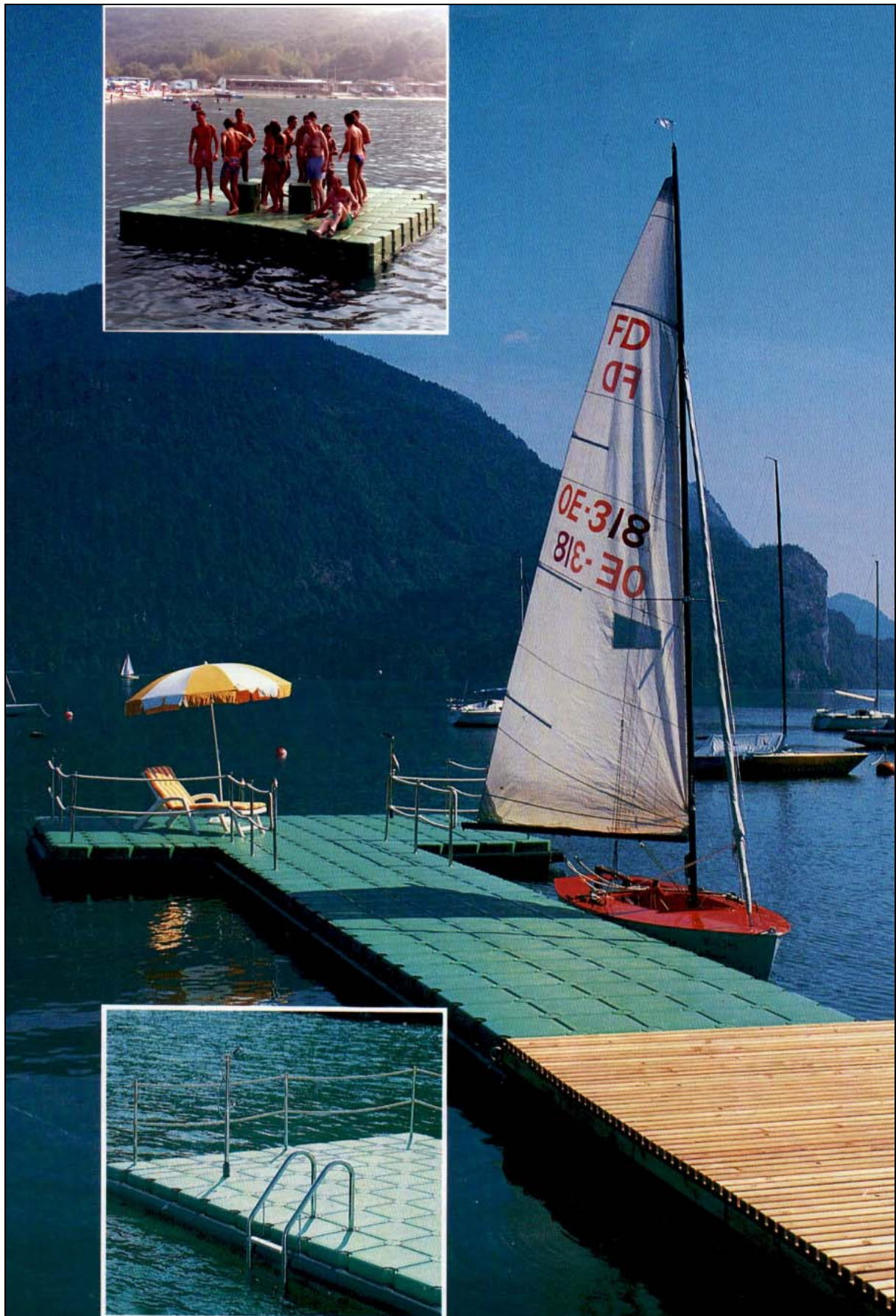
The base station is designed to sit in an office or control room. It communicates with all the transmitters, collects the information and sends onto the PC to data log the information and view the data. The base station has two alarm/control relays so if any one or more of the probes detects a problem, the relays can be activated to trigger your alarm system. The PC does not need to be on for the system to control or alarm. The alarm condition and probe location will be displayed on the base station LCD. One Base station can support up to 50 oxygen transmitters and 100 oxygen and temperature probes.

The transmitter station is a solar powered wireless radio transmitter fitted with LCD display for two oxygen probes, two temperature sensors, and two digital inputs and fitted with two relay control or alarm out-puts. The unit will transmit over a distance of at least 300 m. If longer distances are required a repeater may be fitted to take the distance up to 3 km or more. The transmitter is in a self contained IP65 enclosure with its own battery and solar cells. The battery alone will power the unit for 3-6 months, but with the solar cells it will not require a battery change for at least 5 years. A 230 VAC/12 VDC uninterruptable power supply, rated at 2 amps with a 5 amp internal back-up battery for the transmitter module which will the battery will keep running for around 30 days, is available as accessoire.

The robust and easy to use (60 mm large) oxygen probe is a self polarising membrane covered galvanic cell that generates an electrical signal proportional to the oxygen pressure it senses, no matter whether it is in water, air or another medium. It is connected using ordinary cable, which can have any length (up to 1000 m) and does not need an external supply because it makes its own electricity. Cleaning the membrane (with a cloth or tissue) is, apart from an occasional calibration, the only routine maintenance necessary.



# BOATDOCKS





# BOATDOCKS

## Modular floating dock system

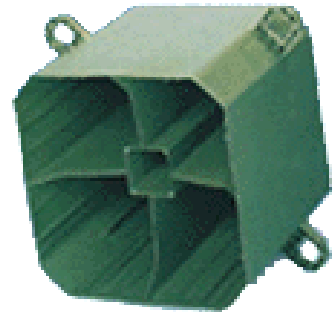
25 years experience in "state of the art" floatation engineering worldwide, together with cutting edge technology and the most advanced production techniques are the base for the new extremely versatile "Pontoon Building - Block System". By utilising the friction coefficient achieved by independent controlled flooding of modules we have refined this system to provide not only the most stable floating platform available, but also a high load capacity which can also be combined with a fender-sidebar system.

The single modules are easy to handle (weight: 6.2 kg) and guarantee a very high load capacity of 360 kg/m<sup>2</sup> (815 lbs/10.8 sq ft). They are made of a high-quality synthetic, UV-stabilized and anti-static material (green or blue) which is extremely resistant to the elements! With block measurements of 50 x 50 x 50 cm (1.65 x 1.65 x 1.65 ft), the standard freeboard is approximately 40 cm. Blocks are easily assembled (with an assembling wrench) by connecting 4 elements (= 1 m<sup>2</sup>) via connecting lugs, with a bolt which gives a secure and stable connection.

This building block system can be varied according to any desired layout or measurements and can be used to replace or extend existing pontoon systems. This seawater and acid resistant system requires no maintenance or cleaning and is extremely durable. It can be utilised throughout the year or the single modules can be stacked and stored. Other than closed floats, this system does not blow up in the sun and is also save against attacks from *Teredinidae*.

Unlike conventional wooden floats, the pontoons are made of a skid-proof material, and will not rot, it is also safer as it won't splinter, or have sharp edges, rusty nails etc. The "Maritime Technic - Pontoon System" contributes to water purity and is aesthetically pleasing. It has lugs (ears) along the sides where various accessories and anchoring configurations can be attached.

Swimming ladder, railing post, anchoring holder and boat fastening-eye are main accessories, with options such as side screws and bars as well as fenders, ropes and anchors. If necessary also access ramps and gangways can be produced according to customer design. For marinas electricity distributors (w/wo illumination) and water suppliers are available.



# BOATDOCKS

## Multi-purpose aluminium boats

These boats are made of seawater resistant aluminium, welded with modern technologies and need no antifouling. The integrated floats secure these boats are unsinkable.

As accessories the following is available: stand with steering, build-in-tank, electro-outfitting, swimming ladder, reeling and cover etc.

The smaller recreational boats Type A are made as multi part and can be divided for transport (to 125 x 135 x 55 cm) or also extended on demand by additional body modules.

The larger working boats Type C are made in double wall and are verified by Lloyd's Register in Hamburg and have the EU-conformity certificate (CE-Module-C).

The following boats are available as standard:

Type	230A	350A	480A	470C	610C	750C
Length cm	230	350	480	470	610	750
Width cm	135	135	135	180	180	180
Height cm	48	48	48	75	75	75
Weight kg	45	60	80	250	300	400
Loading kg	200	250	350	450	600	800
Parts	2	3	4	1	1	1
Motor HP (max.)	6	10	15	40	60	80



Type A

Type C

## Inflatable working boats



These well sized inflatable boats with thick liner are exactly made to requirements of today's customers. The high quality materials and production guarantee safety and long live, also in seawater. The large tube diameter (35-56 cm) with 2-6 air chambers and the special form secure a high stability and security.

The boats are available in different sizes from 200-577 cm in length and 134-239 cm in width, for a load of up to 1000 kg and an outboard motor up to 120 HP.

# BOATDOCKS

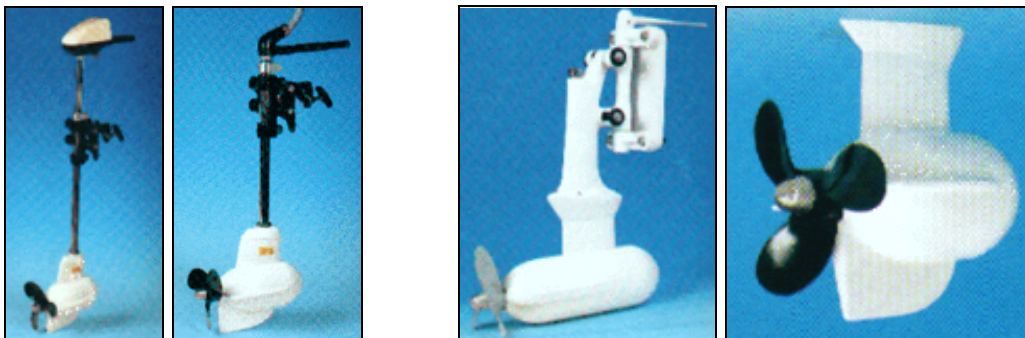
## Professional electric boat motors

An electric motor is practicable for boats up to 9 m in total length. These electro motors have, in contrast to engine-driven motors, different turning moments and resistance, which allow using electro motors with relative small power ratings. Longtime experiments showed that the power rating of an electro motor can be 1 : 2.0 to 2.5 compared to a petrol motor.

At all models the casings as well as all connections are made from seawater resistant aluminum. All other metal parts including screws consist of stainless steel. All parts as well as the motor are covered by a special coating or plastic to resist the weather conditions. The production is based on the highest requirements and precisions. Each motor will be tested to optimal electric performance.

The shaft models (weight 19-21 kg) are delivered ready to use with cable, fuse and build-in switch, and must be only connected to the battery. They are available in 3 power ratings (500, 800 or 1400 Watt) with 4 stages (2 forward- and 2 back-) and are available in different shaft lengths for various boats.

The flange models (weight 15-35 kg) are delivered complete with cable set, fuse and switch which must be installed together with the pin for navigation. They are available in 4 power ratings (800, 1400, 2000 and 3000 Watt) with 4-6 stages.



Shaft-models

Flange-models

For all models a special foldable propeller is available, which guarantee that the motor does not turn if it is not in use and allow to reduce the flow resistance and noise. As accessories special batteries and a motor regulation is available.

On request we deliver also petrol or diesel outboard motors.

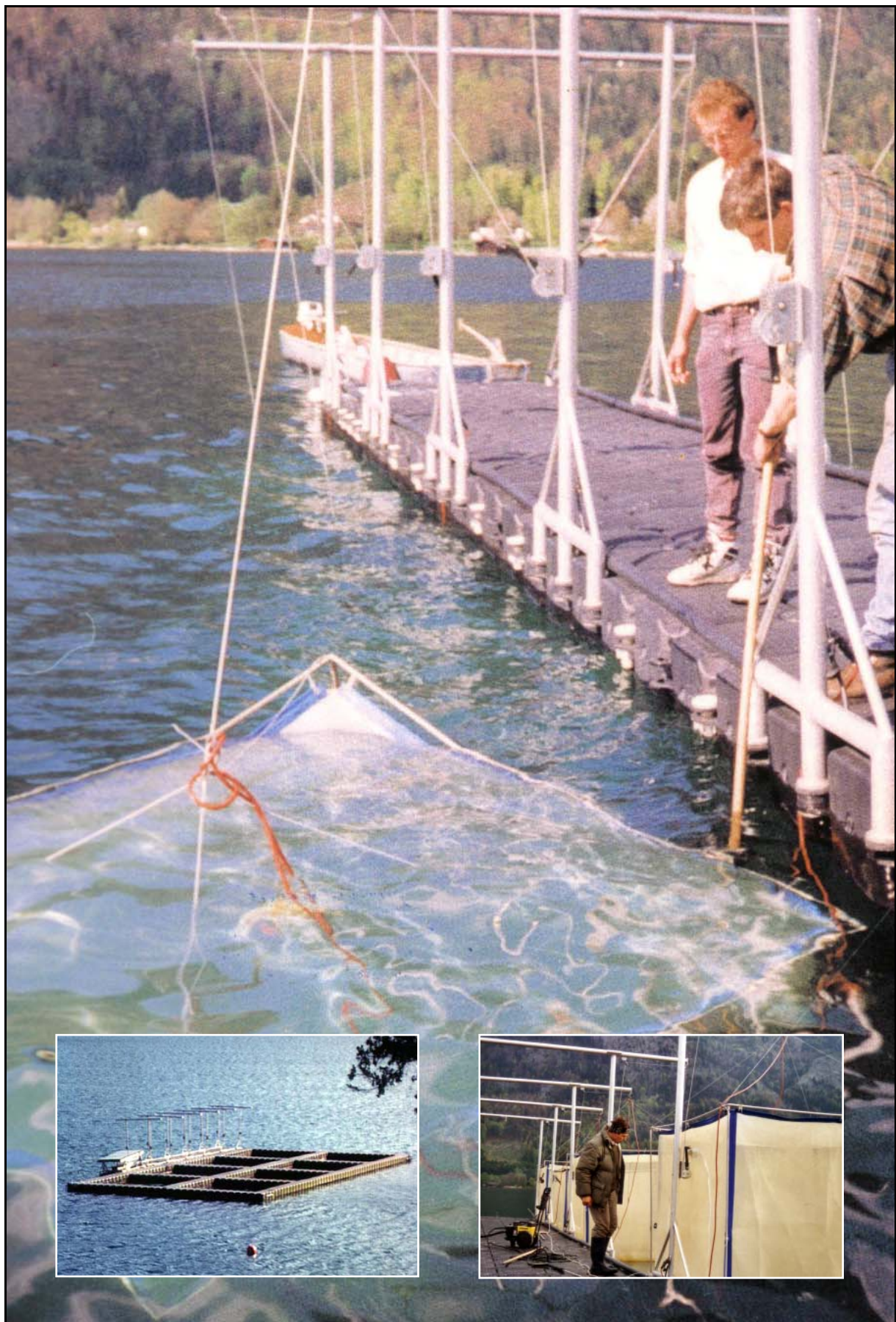
## PE-ropes for a fixed connection

The buoyant and jerk-absorbing all-round rope, twisted from PE threads is UV-, oil- and sea water-resistant. It is available in the colours orange or white with 6, 13 or 20 mm in diameter and has an enormous traction power of 1 or 3 and 8 tons.

No splices anymore: Inside the rope a cavity is created by pushing the rope together, into which by the network, the rope end is slid and so a stable connection without interlocking develops. Which keeps absolutely safe when demanded, but however it is also again easily to be opened afterwards.



# NETCAGES



# NETCAGES

## Illuminated net cages for the fingerling production with natural zooplankton

20 years' experience in the field of global plankton research and fingerling production with natural plankton and years of tests under different environmental conditions in marine and fresh water, where the base of the new "UWG-solar cage system".



The production method is based on plankton feeding in the natural environment like: lagoons, bays, fjords, lakes and large ponds, by means of attracting the organisms using a lamp located in the centre of fine meshed submerged nets. Mainly Copepoda and Cladocera, but also a variety of other plankton organisms are photo sensitive and steadily swarm into the cages towards the light source.

The 2 x 2 x 2 m net cages (volume 8 m<sup>3</sup>) are manufactured from highly resistant mono-filament polyester fabric (with mesh sizes from 0.3 to 2.0 mm), is fitted with a zipper for easy access and a conduit for the electric cable. The net cage is stretched onto a strong stainless steel or aluminium frame and submerged into the water column. An efficient solar generator is supplied for remote site operation. An electrical transformer can be supplied in order to reduce voltage to safer levels for use with water. The whole system is installed on a floating dock and anchored somewhat away from the shore. As site for such a cage system, still or standing waters with a plankton stock of min. 500-1000 zooplankton organisms per m<sup>3</sup> during the time of operation, are suitable. Depending on the zooplankton population, the fish stocking density (from the fry stage to fingerling size of 5 cm length) can come to 5000 Ind./m<sup>3</sup> and survival rates of more than 90 % have been achieved with various marine and freshwater fish species.

## Circular net cages for all conditions

We supply a wide range of single, double and triple ring cage collars, using black high density polyethylene (HD-PE 80-100) pipes in sizes from 200 to 450 mm Ø, optional mounted with either dip galvanized steel or injection moulded plastic brackets (mounted every 2-3 m).

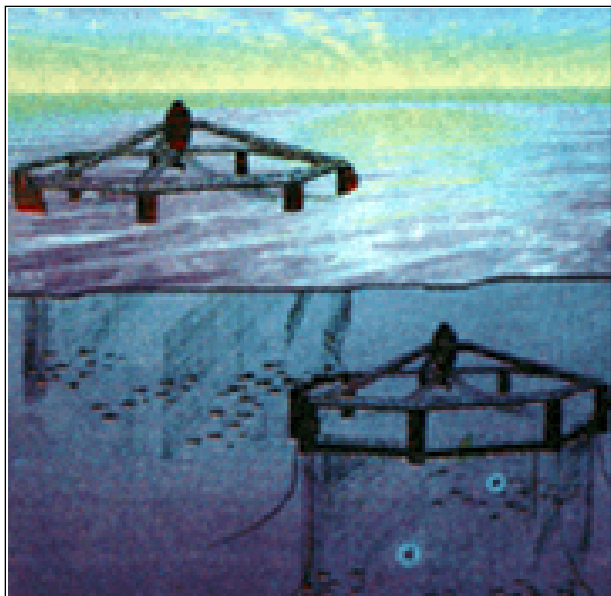


All build with heavy gauge handrail and upright pipe (110-160 mm Ø) to resist deformation. The tailor-made circular cages with a diameter from 10-60 m (32-189 m circumference) can be prepared for all types of weather and sea conditions from seabay to offshore sites. A safety chain inside the outer pipe ring and dividing plates welded inside the inner pipe ring, are available for safety reasons. A full circumference walkway decking is available optionally. A bird net stand, a dead fish collector and a sinker tube ring are available as accessoire. The cage pipes are shipped in parts and are welded on site.



# NETCAGES

## Submersible waveproof offshore cages



The three-dimensional (polygon) framework (axial diameter ~20 m) forming a regular nonahedron in plan, with service platforms, passage walkways with railings and removable hand-ropes. The framework house ballast tanks and compressed air cylinders, permanent buoyancy compartments, balancing tanks, and compensation tanks of residual buoyancy resulting from discharge of changing loads. Hot galvanized coating provides the structure service life of more than 20 years. The coating is reliable, practically excluding restoration and repair.

The system of automatic underwater feed distribution is intended for storage and measured distribution of feed for an autonomous operation of 7-30 days. The system consists of a water tight bunker of 3000 liter (2 tons feed in average) of cylinder-conic shape and an automatically feed distributor with a volumetric type dosage. Inside the feeder the upper part houses solenoid valves, system controller and batteries. The system is made of corrosion-proof steel (6-8 mm thickness) and non-ferrous metals.

To submerge and surface the cage it is equipped with ballast compartments filled by gravity via drain holes equipped with valves with a remote control pneumatic drive. The water from ballast compartments is replaced by compressed air supplied from the service boat compressor. The process of submerging and surfacing is supervised with the depth sensor, its display being located at the service boat or via water acoustic communication channel from the shore.

Flexible pipelines and electric cables coming from the signal buoy to the cage and supplying compressed air and providing power supply. Safety is provided by flashing beacons and corner reflectors, also at the feed bunker.

The net chamber with a volume of 1000 to 2000 m<sup>3</sup> is placed within the steel structure at special guy-ropes, running up and down from the platform. To remove wastes from the net chamber it is equipped with a specially tray device which is lifted to the surface with the help of winches.

It is possible of positioning the cage system in a depth range in the water column of 4-40 meter. Floated the system withstands force 6 and respective wind speeds and waves up to 6 meter. Submerged it withstands force 9 and respective wind speeds and waves up to 8-9 meter.

The experience of the underwater system operation has proved that the operation in the water column is the most effective measure to protect structures from corrosion. The cage structure is produced to the "Rules for Building and Classing Underwater Vehicles, Systems, and Hyperbaric Facilities" and passes control assembling and testing. It will have the certificate of the official "Maritime Register of Shipping".

We produce also traditional square cages of any size, based on our pontoon system!



# NETCAGES

## Precision cloths for aquaculture and hydrobiology

The fabric program includes precision sieves of different material strengths and offers a narrow mesh grading from 20 to 2000 micrometer and therefore fulfils all requirements of today's aquaculture and hydrological needs. Appropriate sieve fabrics are offered per running meter and as standard or customised products, such as filter-, dip-, hatching-, cage- and plankton-nets.

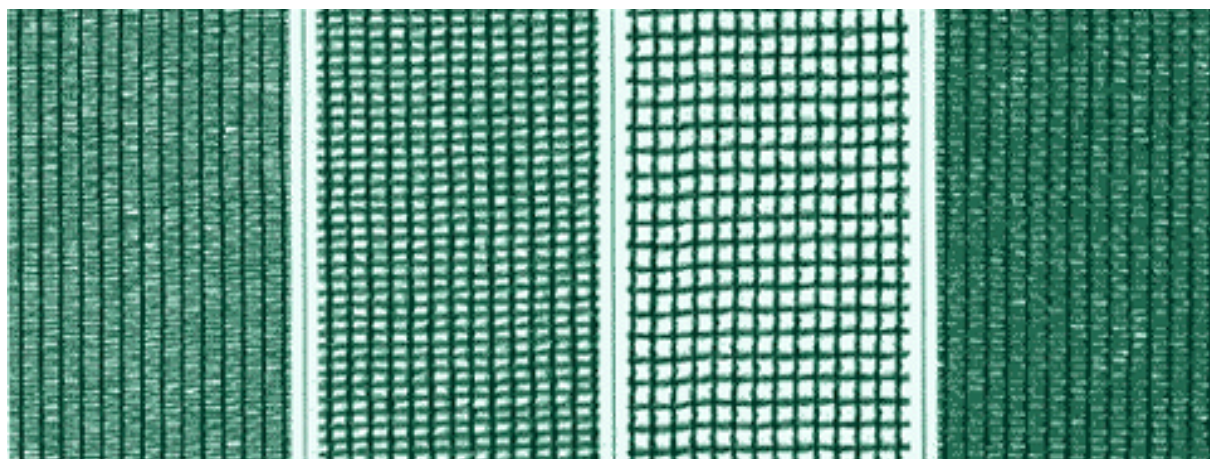
In Austria the catch of zooplankton for the production of fry and fingerlings is commonly practised since more than 50 years. During the last years several important improvements are archived allowing a better net construction and easy catching. With appropriate designed plankton nets, harvests of several tons per day can be achieved. Thanks to this Austrian development of special sieve-net-systems, it is possible to grad the plankton in 3 different size classes during the catch. The result is the correct plankton size for all development stages from fish larvae to fry and fingerling. An expensive and complicated indoor-production of prey organisms (such as: Algae, Rotatoria, Artemia, Daphnia etc.) is not necessary.



## Polyethylene shading sheets and protection nets

These shades are made from UV-stable polyethylene material and protect fish and ponds from leaves, direct light and bird attacks the same time.

The sheets are available on coils with a width of 3, 6, 9 and 12 m, and are also manufactured on size with extra strong hem and eyes. For pricing always the width of the coil is calculated.



Shading value: 75 %

65 %

50 %

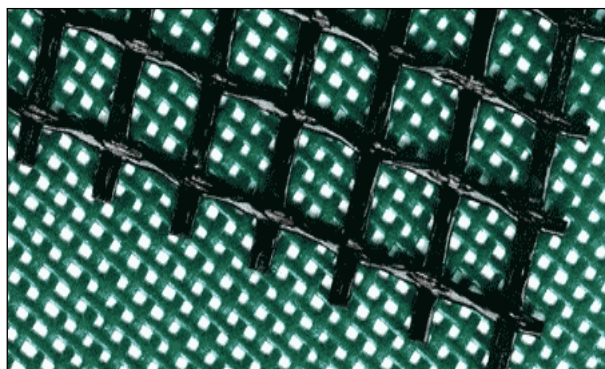
85 %

We supply also polyethylene bird protection nets in any length with a width of 10-24 m and a mesh size of 12-30 mm.

# NETCAGES

## Polymer coated polyester nets for cages

This special polymer coated polyester net is very strong and stable, but also flexible. The nets are 100 % stronger than conventional nylon nets, are highly UV-resistant, suitable for seawater and need no antifouling. They need less maintenance and have fewer fish escapes than nylon nets. Nets having been in use for more than 10 years still look like new and save a lot of operation costs!



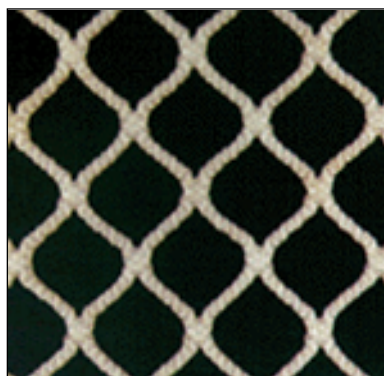
The material is available on coils with a width of 3.6-3.8 m with a mesh size of 5 and 12 mm, and 5.0 m wide with a mesh size of 20 and 40 mm. With a weight of 450 to 550 g/m<sup>2</sup> the cages need no lead sinkers.

We deliver finished cages or also just the material on coils with the following specifications\*:

Type	45/45-40	50/50-20	40/40-12	40/40-5
Square mesh size (open area)	40 mm	20 mm	12 mm	5 mm
Weight/m <sup>2</sup>	490 g	550 g	500 g	450 g
Tensile strength (DIN 53857) Warp	45 kN/m	50 kN/m	40 kN/m	42 kN/m
Tensile strength (DIN 53857) Weft	45 kN/m	50 kN/m	40 kN/m	41 kN/m
Expansion force	10 %	12 %	15 %	15 %

\*All data are average (+/- 10 %).

## Nylon nets for cages and fishery



The production is based on a complete process, from the raw material, passing the different manufacturing phases like: matching, weaving, cutting and packing. Our aim is to assure a quality product to the customer. Woven in nylon (6), all our nets are sewed with double or triple rows of stitching. Usually knotless netting is used, but on request and depending on use, also knotted netting is available. The finished nets are delivered in any shape or size with a mesh size of 4, 6, 8, 10, 12, 15, 18, 20, 25, 30 and 35 mm, or only the net material.

Special UV- and antifouling impregnations (green or transparent) are possible, which guarantee a longer stability of the nets and they have not to be cleaned as without antifouling. On request we can deliver the nets also in various colours.

We supply also trap-, cast-, seine- and gill nets in various dimensions and sizes.

# NETCAGES

## Seine nets in two designs

Seine net with bag - consisting of two wings and respective bag in between, for the catch of fishes in lakes, rivers and ponds etc.

Seine net without bag - consisting of a well vault single wall, for the harvest of fishes in ponds, raceways and tanks etc.

Both nets are complete ready to use mounted in strong ropes, with foam floats and lead sinkers.



## Cast nets in two arts

Traditional Art - the lower line with harvest bags, which catch the fish.

Yugoslavian Art - the lower border will be formed to bags by ropes during lifting.

Both nets are complete ready to use and have a circumference of about 7 m, a height of approx. 1.7 m and a mesh size of 11 mm as standard.



## Scoop nets in two forms

D- or O-formed strong, corrosion free scoop frames (wide 40-70 cm) with protection and preparation for handle.

Both nets are complete ready to use mounted with net bag (mesh size 4-20 mm), and a handle (length 1.3 m) from hard-wood as accessoire.

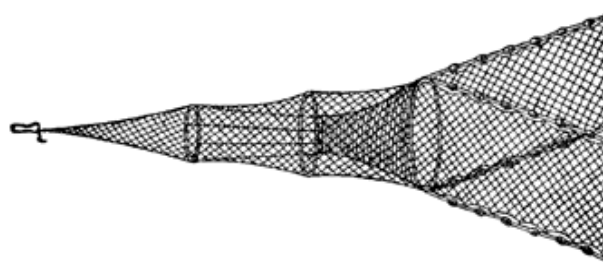


## Trap nets in two outfits

Fish traps - with one trouth and three galvanized iron rings, as well as two wing nets each 1.5 m long.

Fish bags - with two trouths and five iron or plastic rings, as well as two wing nets each 2.0 m long or a 3 m long guide net.

Both nets are complete ready to use. Longer wing or guide nets with floats and sinkers are possible.



## Gill nets in two versions

Single or tripple sheet gillnets with a mesh size of 6-150 mm, in various heights and lengths.

Both gillnets are available loose or mounted ready to use with lead and float line.





# POWERPLANTS



# POWERPLANTS

## Electric fishing devices with direct- or impulse-current

This save and powerful electric fishing devices are successfully in use on all continents since over 20 years. Through the various and sometimes problematic areas of use, a wide range of devices was developed which will match nearly any requirement.

All devices are produced to VDE-regulations and are TÜV-tested. The electric building corresponds to security class II. Therefore all power delivering parts are doubling isolated and guarantee the best possible security for persons. A "Totmannswitch" (in Germany required) guarantees for additional security, so that all outlets of the device are without electric current if dangerous situations arises. The permanent excited generator and the high quality magnet materials guarantee a continuous and reliable power. Each device will be tested mechanically and electrically completely and delivered with user manual.

Direct current creates usually a better anodic reaction as impulse current would doe. But at extreme conductivities or for electric barriers with direct current soon the borders are reached. As result, devices with powerful combination (Direct-/Impulse-currents) where created, where the impulse frequents and volts can be adjusted (via motor turns or switch). The back-carry units are compact lightweight systems with high outgoing power. Impulse devices are a little larger and have a little more weight than direct current devices.

We deliver net-, battery- or petrol-driven back-carry- or stand-devices with direct-and/or impulse current with an outgoing power of 250-11000 Watt (5-160 kw/impulse at 25-100 Impulse/sec.), and a current of 300-960 Volt with a weight of 10-135 kg and for a conductivity of 50-10.000  $\mu$ S.



Backcarry-unit



Stand-unit



Net-unit

As accessories are available: 30-50 cm Ø stainless steel anodes with RGP-electro handles up to 6 m in length, copper-cathodes with cable and connector, plastic cable drums for up to 200 m rubber cable, hand or foot urgent-stop-switches, electro-rubber outfit (tested to 1000 Volt) as well as tanks and lights.

Electric fish guidance systems and barriers are available on request.



# POWERPLANTS

## Hydroelectric power plants for low water quantities

These mobile and economic hydroelectric power-plants are suitable for your own energy production at mountains and in fish farms and also other objects situated in higher or remote sites.



They are also economic if only low quantities of water are available (from 1 l/sec) and a height of 5 m (pressure 1 bar) on. The compact systems needs no concrete bottom and can also be placed in open air. The water supply is made quite easy by a pipe-line. The used water flows freely from the power-plant and could be used for other purposes later or flows back to the stream or river. The system does not affect the water quality in any way and therefore could be installed prior to drinking water or fish farms sources.

Depending on the water flow, the Pelton-Turbine is driven from a regulated (and possible a second, unregulated) nozzle. The wheel drives then a self-regulated generator. The generator size and reduction will be adapted by us to the optimal conditions, but can be adjusted later on also without problems to new conditions. The produced energy (115/230 or 230/400 Volt AC, 50 Hz or 60 Hz) can be used directly from the connected regulator and distributor box. This box can be placed also on any other place. To guarantee stable power sequences by variable energy usage, an electronic power regulator or an electronic flow regulator are available. Also an automatic nozzle regulator is available. The system is switched off easiest by closing the nozzle(s). All parts are made of durable and anticorrosive materials. Larger power-plants, on request.

## Water cooled diesel generators

These compact synchrony-generators are more powerful than asynchrony-generators. Motor, generator and exhauster are water cooled and need no air ventilation. The cooling water can be used for heating. They are installed into an encapsulate housing which guarantees low noises (52-54 dB). The units have a weight of 83-230 kg and are easy to operate with the supplied remote control unit. The diesel consumption is about 0.3 liter per produced kwh. Available in different power ratings from 4-16 KVA (3.5-14.0 kw).





## TRANSPORTING



# TRANSPORTING

## Isolated transport tanks for live fish



These professional tanks for the long distance transport of live fish are made of strong double wall reinforced glass fibre polyester in white colour, isolated with 2 cm thick foam panels and metal fittings made of stainless steel. On the top, the tanks have an anti-slip surface, which makes it possible to walk and service them safely. For the save transport they also have a well closing splash-proof cover, air and oxygen connections as well as a handle.

The tanks have a 2" outlet and a water-proof hatch for water drainage or exchange, situated on the front wall. A large outlet gate with inner closing door allows easy emptying the tank of fish and water. As option these tanks can be supplied with dividing inner middle wall and a second outlet gate. As accessories mounting corners, an outlet chute or an outlet funnel with pipe adapter are available.

The following types are available as standard:

Model Type	Volume Liter	Length cm	Wide cm	Height cm	Cover cm	Gate cm	Weight kg
TT0800	800	120(137)	90	85(101)	75x60	33x29	115
TT1000	1000	130(147)	100	85(101)	75x60	33x29	125
TT1200	1100	170(187)	105	75(100)	75x60	40x29	150
TT1400	1350	170(189)	105	90(114)	75x60	33x29	165
TT1600	1600	210(227)	105	88(112)	110x75	40x29	175
TT2200	2200	222(241)	105	113(137)	110x75	40x29	205
TT2800	2800	222(241)	105	136(160)	75x60	33x29	215
TT3000	3150	222(241)	105	152(176)	75x60	33x29	235

The numbers in brackets are overall dimension with gate and cover.

## Fish transport tanks in any size

This individual tanks for the save transport of live fish are made of reinforced glass fibre polyester with a smooth surface in the colours white or green. To use the space of the transport vehicle more economically all tanks can be manufactured to customer design with your individual layout dimensions. All tanks are supplied with well closing, removable cover and lid as well as hand grips. As option these tanks can be supplied with slanting inner bottom and splash protecting top and with drainage valve with sieve and outlet gate with door.



As accessories installed (12 Volt, DC) circulation pump systems or compressors with diffusers, pressure reducers with flow meters, or oxygen cartridges are available.



# TRANSPORTING

## Lifting nets with automatic lock

These lifting nets can be used perfectly to harvest larger fish quantities gently from raising- or holding-units. The fishes are harvested directly with the lifting net from cages, tanks or other systems where the fish are already kept in high density by using a crane (see picture). For opening the base of the net, simply the rope of the automatic lock is pulled, and the fishes are released gently. The lifting net is available in a diameter of 1 m diameter and different outfits (just with 50 mm outer net, and with or without tarpaulin inside, and with or without 10 mm inner net). It comes with frame, ropes and automatic lock.



## Lifting device for live fish



These lifting devices work with an „Archimedes Screw“ (38 cm Ø) and are suitable for up to 6 t/h of any fish species and sizes between 3 and 3000 g. They are mobile and used mostly for movement of live fish, from and between ponds, raceways or net cages - to graders, transport tanks or slaughtering etc. The frame guarantees easy regulation of the screw angle and placing it in various positions. At the outlet a pipe system can be connected.

They are complete equipped with: screw made of fibreglass reinforced polyester, frame made of stainless steel, wheels made of hot-galvanized steel, motor (380 V 0.7 kw), and are available in lengths of 4, 5, 6 or 7 m for a lifting height of about 2-4 m.

## Vacuum pumps with weighting system

With two (hot galvanised or stainless) steel vacuum tanks (200 liter each) that suck and discharge alternatively, this adjustable fish pump is used for loading of transport tanks. The (up to 6 m in height) moved fish are separated from the water through a grill separator and thus sent into a container connected with a weight indicator with electronic digital display, programmable either on loading quantity or working time. By dimensions of 165 x 430 x 340 cm (maximum height 5.1 m) and a weight of 1,550 kg up to 15 t of fish up to 1.5 kg (on request up to 3.0 kg) can be moved.





# TRANSPORTING

## Live fish graders with or without counting system



These graders are made of aluminium and stainless steel and are available for various fresh- and sea- water fishes from Salmoniformes and Perciformes to Siluriformes and Cypriniformes etc. The grading technology is based on 3 V-shaped channels with moving plastic fingers below, which moves the fish until the channel is too wide for the fish thickness and the fish are released to the collecting tanks below, from where they are flushed with water to the outlets, and optionally by pipes back to the holding ponds. During the whole grading process fishes are kept wet.

The machines are mounted on an adjustable trolley with 3 wheels, quipped with 380 V/50 Hz motor as standard (230 V/50 Hz on request).

As accessory an automatic counting system can be connected after the graders.

The following models are available:

Model	H10	H20	H30	H40	H50
Grads	3	3	3	4	3
Fish sizes	1-50 g	2-100 g	5-500 g	5-1500 g	5-2500 g
Grading capacity	1 t/h	3 t/h	5 t/h	7 t/h	9 t/h
Channel size (LxW)	1600x28 mm	1300x28 mm	2000x42 mm	2500x52 mm	2500x75 mm
Grader outlets Ø	3x125 mm	3x125 mm	6x160 mm	8x200 mm	6x250 mm
Dimensions (LxWxH)	3.3x1.0x1.4 m	2.5x0.5x1.2 m	3.5x1.0x1.3 m	4.0x1.0x1.3 m	3.7x1.2x1.5 m
Weight	260 kg	115 kg	190 kg	230 kg	300 kg
Power	0.25 kw	0.25 kw	0.25 kw	0.25 kw	0.55 kw
Water requirement	20 m <sup>3</sup> /h	15 m <sup>3</sup> /h	40 m <sup>3</sup> /h	40 m <sup>3</sup> /h	50 m <sup>3</sup> /h

## Adjustable grading device for fingerlings



This grading device is especially suitable for hatcheries or small farms. The distances of the grating can be easily adjusted by shaping the device to a rhomb. The seawater resistant impregnated wooden frame keeps floating and an exact distance between the aluminium grates.

Available in two sizes:

Type	Small	Large
Device dimensions cm	36x36x18	45x45x18
Grading distance/thickness mm	4-17	18-30

# TRANSPORTING

## Fish counting system for much fish

These fish scanners are based on a patented counting principle which gives both high capacity and accuracy (98-100 %). The fish flows freely through a pipe and passes an advanced camera/measuring system (CCD Camera chip) which will register the size and speed of the passing fish. The resulting data is then transmitted to a control unit which may handle as many as 4 channels (e.g. during grading) simultaneously. It is not necessary to have any space between the fish passing simultaneously. The robust and reliable electronics of the system will always provide the total number of fish passing through the unit. The splash proof counters are easy to use and suitable for direct fish pump or grading machine feeding.



The control unit (dimensions W x H x D 28 x 13 x 37 cm, weight 5 kg) is made from powder-painted marine aluminium case which is sturdy, splash proof and user-friendly. The power supply is 100-240 VAC 50/60 Hz, 12 or 24 VDC (150 Watt power inverter available as accessory). The input channels can power and control up to 4 CSE or 2 CSF registration units at the same time. It has fluorescent buttons and backlit display, and also connectors for auxiliary equipment like PC, and PLC control etc. The adjustable carrying handle can also lift the front of the control unit (to approx. 10°, 30° and 45°) for easy operation and a better view.

As options an external siren (115 dB) and a PC monitoring system (requires a COM-cable) is available. The control unit can easily be connected to a PC to monitor and log the counting. Optionally easy-to-use PC software which will in addition to presenting the accurate number, give you all the information you need from the counters. It gives you real time monitoring with key features like: number, weight (average/total/distribution), speed, efficiency, unit status, lens check, systems log and printing the results.

The CSE registration units are used for "dry"-counting (pipe 0-25 % full of water through the unit) and suitable for many applications.

The CSF registration units are used for wet-counting (pipe 100 % full of water through the unit) and suitable for special applications.

These registration units are available in different sizes (DN 150-350), weights (14-80 kg) and power consumptions (10-33 Watt), for different fish sizes (1-10000 g) and capacities (10-100 t/h). All registration units are delivered with 10 meter cable, other lengths available on request. As accessories some flange to pipe adapters (DN 150-350), as well as a video system (b/w) is available.

# TRANSPORTING

## Universal scales with flat platform

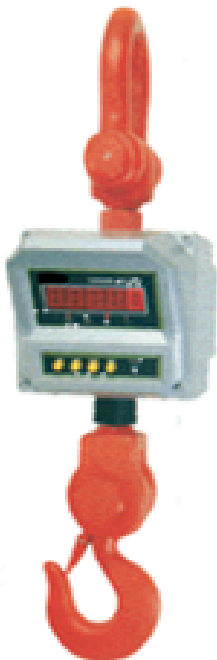
This new flat scales with stable base, 4-cell measurement technique and corrosion free platform made from stainless steel (only 55 mm high) are universally to use. The removable display with spiral cable, 25 mm LCD digits and 100 % tare function can also be mounted on a wall. It is possible to select continuous display or automatic switch off. The energy supply over a rechargeable accumulator with charger allows a mobile use. The model VS is available for use with accumulator or net connection and has additionally two inserted transport wheels and a handle.



The following models are available:

Model	BL-60	BL-150	BL-300	VS-200
Range up to	60 kg	150 kg	300 kg	250 kg
Division	20 g	50 g	200 g	100 g
Dimensions (LxWxH)	550x550x55 mm			900x550x55 mm

## Crane scales with turn-able hook



These stable and professional scales for a crane with robust and tight casting from aluminium are equipped with a turn-able security-hook and build for 100 % over the range.

The display has 25 mm large red lighting numbers. The microprocessor controlled scale is equipped with automatic 0-point and tare-function until the range. The weight-fixation allows processing of weight-value also during swinging of the goods. The energy (for up to 80 hours) is supplied through a build-in accumulator with loader. All models are suitable for the use with a remote control unit.

The following models are available:

Model	CS-50	CS-100	CS-300	CS-500	CS-750
Range up to kg	500	1000	3000	5000	7500
Division in g	200	500	1000	2000	5000
Weight kg	15	15	18	35	38

We deliver also: Precision-, Analyse-, and Table- or Pocket-Scales, for ranges up to 10 t or a division from 0.0001 g on!



# TRANSPORTING

## Motor driven pumps for any purpose

This self priming, compact pumps are especially suitable for the use in aquaculture, agriculture and industry and can also pump sludge or small stones. Driven by a strong and economic 1 cylinder - 4 strokes "Honda" petrol motor, these centrifugal pumps are environmentally friendly and reliable. A transistor controlled starter guarantees easy running also after longer pauses. The types WT are also for waste water and stones up to 3 cm diameter available. Type WM is especially suitable for seawater and chemical as the pump casing is made from polyester. All pumps are delivered completely with hose adaptors and ground filter.



Type 10



Type 20



Type 30

The following pumps are available:

Type	WX 10	WX 15	WB 20	WH 20	WM 20	WT 20	WT 30	WT 40
Pumping volume l/min	130	240	600	500	850	650	1300	2300
Pumping height max. m	35	40	32	50	32	26	30	29
Suction height max. m	7.5	8.0	8.0	8.0	7.5	8.0	7.5	7.5
Connections mm/inch	25/1.0	38/1.5	51/2.0	51/2.0	51/2.0	51/2.0	75/3.0	100/4.0
Motor kw/HP	1.1/1.5	1.8/2.5	2.9/4.0	4.0/5.5	4.0/5.5	4.0/5.5	5.9/8.0	8.0/11.0
Tank volume liter	0.6	1.2	2.5	3.6	3.6	3.6	6.0	6.5
Consumption liter/h	0.6	1.1	1.1	1.6	1.6	1.6	2.0	3.3
Weight kg	7	10	21	27	26	38	58	68
Length cm	33	33	47	52	52	62	66	66
Width cm	25	27	35	40	40	46	49	49
Height cm	33	38	36	45	45	47	51	51

## Submersible plastic pumps for direct current

These EC-certified submersible plastic pumps are produced under ISO 9000. These models are available for 12 V DC:

Model/Type	T05	T08	T12	T16
Capacity l/h	1800	3000	4500	8500
Connection Ø mm	19	24	29	32
Consumption A	1.3	2.5	3.0	5.0

# TRANSPORTING

## Propeller pumps for much water

This single stage pumps with open axial propeller are suitable for less polluted water with suspended solids of up to 50 mg/l and a water temperature of up to 25 °C. The left running motor (380/400/500 V, 50 Hz, 1450 RPM, power factor 0.83-0.87 cos) has a failure runner and waterproof coiling. The motor is capulated by a glide seal, the axial and radial wave bearing in water lubricated glide bearings. The propeller is made from bronze (CuSn10), the radial bearings from bronze and stainless steel, and the bolts and screws from stainless steel.



All pumps are made according to DIN EN ISO 9906 class 2, protection art IP68) and are suitable for endurance runn, timed operation or frequenz regulation and are supplied with 10 m dircetly connected waterproof rubber cable. The installation can be in any angels, horizontally and vertically, as well as submerged hanging or free standing. The connection flange is C 200-300 DIN. A niveau regulation, frequenz control, motor monitor and operation counter are available as accessoire.

The following models are available:

Typ	PO-200	PO-250	PO-300
Capacity m3/h	150-320	0-620	0-1000
Pumping height m	5.5-3.0	9,0-0.0	23,0-2.8
Suction height max. m	1.0	2.0	3.0
Power kw	5.0	9.2	30.0
Weight kg	220	270	590

## Multi pumps for many applications



This pumps with vortex propeller made from plastic can be mounted and used submerged inside the water (wet) as well as free standing outside the water (dry) and are suitable for particles up to 6 mm. Because of the strong ceramic bearing they are suitable for endurance runn. All electric parts are enbedded completely in plastic and a thermo-switch works as a overload protection. The split-pipe motor (220-240 V, 50-60 Hz) is specially energy saving and very maintenance friendly.

The large prefilter caps (front and back) can be removed without any tool. The outlet (pressure) connection has a inner and outer winding and is supplied with hose adapters (20/25/32 mm). The pumps of this seria have compact dimensions (LxWxH) of 285x170x170 to 435x240x240 mm and can be used for fresh and salt water. They are deliverd complete woth 10 m cable and plough, as well as mounting feets and handle.

# TRANSPORTING

## Submersible pumps for endurance run

These submersible pumps have a special sealing and bearings for the maintenance free endurance run and are developed for the mobile and static operation in any position. Pumped can be all liquids with a weight of max. 1,100 kg/m<sup>3</sup>, up to 40 °C and a pH-value of 4-8. The motor (2850 RPM) is available for 400 V/50 Hz as standard (other voltages on request). A thermal protection and a double case cooling protect the motor from overload (Protection IP68). On request the pumps are available with an extern or build in floating switch.



Optionally seawater resistant outfits to German Lloyd and Lloyd's Register of Shipping are possible.

The following pumps are available:

Type	C-90	C-70/1	C-70/2	B-60/1	B-60/2	A	O
Pumping volume m <sup>3</sup> /h	0-50	0-24	0-35	0-60	0-80	0-160	0-450
Pumping height m	13-0	15-5	20-0	18-0	25-0	38-0	24-0
Power kw	1.3	1.1	1.5	3.0	4.0	7.5	15.0
Particle Ø mm (max.)	10	5	5	10	5	7	7
Height cm	51	48	48	63	63	74	82
Weight kg	22	24	24	45	45	85	185

## Underwater pumps for pipes



These compact submersible pumps in new design with more stages are maintenance friendly, and are developed for long resistance. As all metal parts like: housing, cable cover, motor adaptor, wheel, valve, inlet screen and outlet connection cable including couplings are made from stainless steel (AISI 304), these pumps are complete resistant against rust. Propeller and diffuser are made from Polycarbonate, the bearing from Polyurethane, and the sealing from special rubber material.

The maximum outside diameter of these pumps is 99 mm or 4 inch (3 or 6 inch on request), so that they fit into a pipe. The outlet connection is 1-2 inch and the length of the pumps is 695-2368 mm and their weight 11-52 kg (depending on types).

We deliver also: Universal-, Circulation-, Underwater- and Sludge-Pumps, for up to 1000 m<sup>3</sup>/h or for over 100 m in height!



## PROCESSING

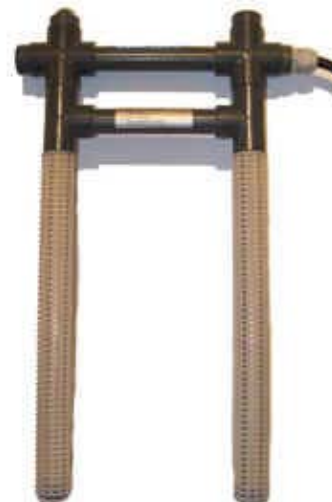


# PROCESSING

## Electric stunning devices for all fishes

This device is especially suitable for the fast and easy stunning of fishes (up to 50 kg/cycle). It works with electricity over a transformer (Input 230 Volt, Output 42 Volt). All parts of the device are made of corrosion free materials. The handle with buttons and lights is made of plastic; the electrodes are made of brass with honeycomb-like plastic cover. The device is available with or without plastic container and cover.

The fishes are placed in a plastic container together with water. For the stunning, both electrodes are submerged into the water and the button is pressed, while the stunning process is controlled by a lamp. To reach all fish correctly by electricity, the electrodes of the device should be moved and turned horizontally.



## Electric stunning devices for much fishes

This device is especially suitable for the save and reliable stunning of fishes (up to 200 kg/cycle). It works with electricity over a transformer (Input 230 Volt, Output max. 160 Volt) with 3 adjustable regulation knobs for the pre- and main stunning process which allows slowly increasing of the current and reduces internal damage of the fishes. All parts of the system are made from corrosion free materials. The container with cover is made from white plastic; the electrodes which are fixed on two sides are made from stainless steel. The containers are available in 3 different sizes (80, 210 or 400 l volume).

The fishes are placed in the plastic container together with water and the cover is closed. For the stunning, the button on the side of the control box is pressed, while the stunning process is controlled by a lamp and terminated by an acoustic signal.

## Special knives for the fish industry



This special stainless steel knives and scissors are designed for long live and resistance to hard wear. They can be used for many hours without problem to archive high productivity. The blades are finished by hand with high quality steel - a guarantee for maximum cutting precision and easy sharpening. Either stiff or flexible blades are available according to requirements.

The ergonomic design of the handles makes them easy and saves to hold. The various designs were developed in conjunction with users. They take into account both the type of cutting as well as the size of the user's hands. The special green plastic material used gives the handle its firm hold.

# PROCESSING

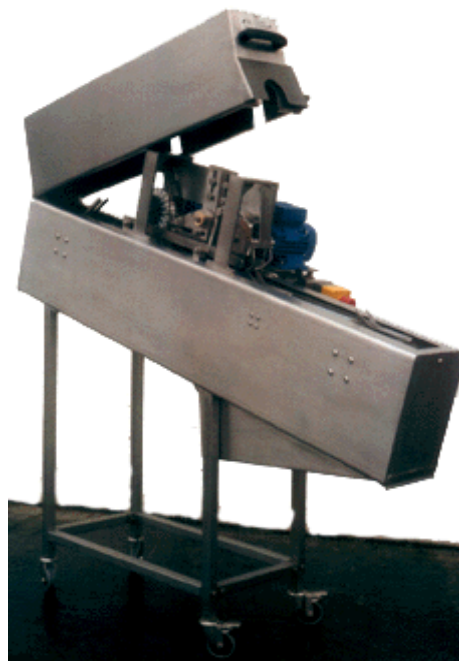
## Auxiliary fish gutting devices for round fish

These gutting devices are in use since more than 20 years and a valuable help for small and medium processing plants. They allow to gut and clean fish from 150-1500 g in one rational working process, without give the fish out of the hand. There is also no need for turning over the fish in your hand as all sequences of operation start from the vent. If the operator should slip in the direction of the blade while cutting, injuries of hands or gut can be nearly excluded. The suction head has two scrape edges at its lower rim. While passing through the fish, all intestines (like guts and kidney) are removed. By pushing a button, a knife comes down and cuts the gorge, which is sucked then into a (30 l) container.

Optionally, the remaining blood is removed by the rotating round washing brush. The rational working sequences enables one person to process 300-400 fish/h.



## Automatic fish gutting machines with fish size adjustment



This compact and robust machine is made from stainless steel and plastic material. It operates without hydro pneumatic or electronic elements and is driven by hydraulic pumps, which are integrated in the frame. The machine is (except a monthly oil control at a viewing glass, and the exchange of knives and brushes) nearly maintenance free.

Complicated and expensive settings are not necessary and allow rentable working. Additional mistakes are impossible as wrong size selection can be avoided with the manual size-regulation (automatic at type Vario). The running speed of the transport chain is as low as possible, to allow to feed the machine just by one hand. A control line at the outlet side allows an optic control. Bad results (about 5 %) can be removed here. As the machine works without cross-cut between gill covers and pectoral fins, there is no additional fish waste.

The following types are available as standard:

Type	Mini	Maxi	Vario
Capacity Fish/h (max.)	1700	2200	3600
Fish sizes g	180-650	350-1000	2000-7000
Water demand l/h approx.	300	500	800
Power (380 V/50 Hz) kw	0.9	3.0	5.5
Dimensions (LxWxH) cm	150x40x135	300x60x180	580x65x175



# PROCESSING

## Automatic scaling machines for much fishes

The robust, solidly constructed machines with belt drive offer perfect scaling technology, with their design (body in stainless steel, automatic time selector and control valve for reduced water consumption) and complete operational safety (auto-stop control, motor protection, restart protection).

Scaling takes place at the bottom and sides of the machine and offers the advantages of short (approx. 3-5 minutes per cycle), low-noise scaling cycles and reduced water consumption. The water used in the scaling process is accumulated, so that the fish are thoroughly washed and a soft cushion of water is formed. This provides a flexible support and ensures that the scaling action is very gentle (fishes are not exposed to heavy bumps). The auto-stop control automatically stops the machine when the loading lid, top lid or release flap is opened. Gentle release is ensured because the machine restarts slowly and the start button must be pressed and held down, which is an added safety feature. An automatic shut down with manual restart guards against automatic start-up after a power failure. The scaling machines are supplied either with a karborundum drum for soft fish or small scales and with a round-hole drum for clams and hard fish or large scales.



The following types are available as standard:

Type	35 S	16 K	18 K	20 K	25 K
Capacity/cycle kg	4	6	10	15	30
Capacity/hour kg	80	150	280	400	800
Electricity Volt	230	400	400	400	400
Rated power kw	0.18	0.25	0.37	0.55	1.50
Water connection DN	15	15	15	20	25
Depth mm	450	372	530	600	735
Width mm	410	435	555	650	750
Height mm	610	855	930	950	1195

## Manual scaling device for all fishes



This device is well protected from spray water, safe in operation and securely insulated, tested to 4000 V. The 230 V/50 Hz ICE standard 0.18 kw motor can be used continuously. The machine L x W x H of 23 x 24 x 19 cm with a weight of 9 kg, can be mounted to a ground or wall socket. The flexible axle is 160 cm long. The ball bearings in the top, with which the fish is scaled, are waterproof. The device is supplied completely with handle, feet and 160 cm cable.

# PROCESSING

## Filleting machines for much fish

The transformation of fish into fillets offer an interesting value added profit margin and is directly depending with the filleting costs. This new generation of filleting machines now comes in different sizes, with dimensions suited to various fish sizes and species (Salmons, Perch, Bass, Bream, Herring, Pollack, Mackerel etc.) permitting an efficient filleting of fish (performance: approx. 800-1000 kg fish/h) with minimum loss of product and high yield production of 50-78 % (Salmonids) of spitted fillets. The yield is directly depending on the state of the freshness and consistency of the fish, its fat content and maturity, as well as the cut of the head (I-, C- or V-cut).



The simple mechanic solutions based on rigorous geometric principles in combination with a sensitive system to the thickness of each fillet, allow the machine to process fishes of various sizes without setting changes. The type number means the maximum fish thickness between anus and dorsum in mm, which the machine can handle. The smart design and sturdy construction (made in stainless steel) insure a long life to meet high conditions and norms of hygiene. All machines work with 2 or 4 blades (and 1 or 2 electric 400 V/50 Hz motors, other on request), are efficient and easy to clean and maintenance.

The de-headed and gutted fishes are loaded by hand into the machine. A 10-12 cm high transport belt carefully transfers (approx. 20 m/s) the fish to the round knife-blades which run not parallel but axial. The blades cut the fillets and separate the waste bones, thus saving over 70 % of the production time. The filleting machines are available with 2 or 4 blades either for the production of fillets with belly bones (ribs) or for the production of de-boned fillets.

The following 2 blade types are available as standard:

Type	Fish Weight kg	Dimensions (LxHxW) cm	Weight kg	Blade Ø mm	Power kw
SF 80	0.1 - 0.5	60 x 54 x 45	65	210	0.55
SF 90	0.2 - 2.0	85 x 120 x 50	92	245	1.10
SF 130	0.3 - 3.0	100 x 125 x 50	110	300	1.50
SF 180	1.5 - 6.0	120 x 135 x 65	170	400	2.20

The following 4 blade types are available as standard:

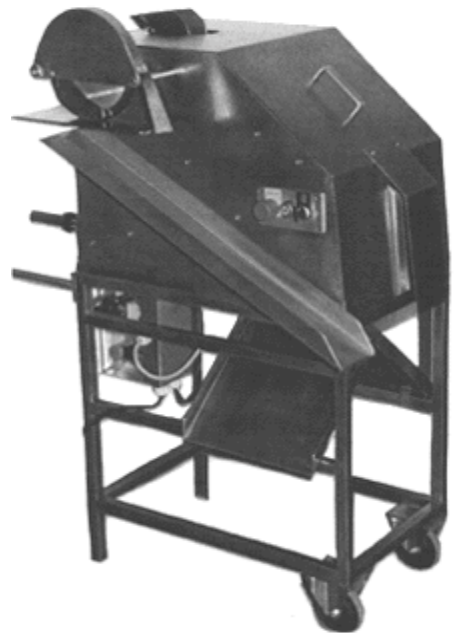
Type	Fish Weight kg	Dimensions (LxHxW) cm	Weight kg	Blade Ø mm	Power kw
AV 70	0.1 - 0.5	85 x 115 x 50	100	210 + 245	0.8 + 0.12
AV 80	0.4 - 1.5	100 x 114 x 50	145	210 + 300	1.5 + 0.12
AV 100	0.6 - 2.0	120 x 120 x 50	160	245 + 300	1.5 + 0.12
AV 135	0.8 - 3.0	140 x 137 x 50	250	330 + 400	2.2 + 0.25

# PROCESSING

## Filleting machine for round fishes

This compact machine allow to fillet all round fish with up to a height of 90-135 mm and a weight of 100-1000 g fast and exact, without gutting the fish. The machine is made of stainless steel and easily cleaned with water. A high output (approx. 100-200 kg/h) and safety measurements allow a fast working. The compact design (L x W x H: 118 x 56 x 127 cm) and the low weight (approx. 88 kg) allow to use it on nearly any place.

With the rotating round blade-knife, first the head is cut off. Following, the fish is put in the machine head-cut first and belly-up. The fish is now forwarded by special grip belts to the round-knifes and 2 fillets are cut. The cut is adjustable, thus allowing a low waste of meat (fillet output approx. 40-50 %). The belly bones have to cut of manually. Continuous cleaning is achieved by water spray-nozzles.



## Y-bone cutter for fish filets



With this compact devices (cutting wide 9, 15 or 30 cm) made from stainless steel, you can cut fast and easy the Y-bones in fillets from bony rich fishes (like Cyprinids etc.). By this cutting in small distances (every 3-4 mm), the numerous Y-bones are chopped in very small pieces, so that they are no longer detected or dangerous in the fillets and can be eaten comfortably with the meat.

With an adapter (available as accessory) you can also cut now the fillets in chips or stripes (and, for example serve it fried or on salad).

There is also an automatic electric (12 or 24 V DC) Y-bone cutter (cutting wide 30 or 40 cm) available.

## Pin-bone remover for fillets

For removing of small and unwanted pin-bones from larger fresh or smoked filets (from about 150 g filet weight on, like: Salmons, Trouts and Charrs) different pinboners, from compact handheld devices to automatic band machines, are available. All machines are building from non-corrosive material to the quality and work with the same principles. They are very user and maintenance friendly and allow fast working.





# PROCESSING

## Skinning machines for all fish filets

This fish skinning machines are manufactured with the use of exclusive and high quality components and according to the newest technical and hygienic regulations. They are made of rust free stainless steel, the transport belts and rolls are made of plastic. Additional plates inside guarantee a very long live of the robust machines, which have no electronic parts which could become defect. All machines are easy to use and very maintenance friendly, which saves additional costs.

All models work with an 230/400 V (50/60 Hz) motor and are equipped with a foot-switch, adjustable knives (the skinning thickness can be adjusted from 0 to 4 mm), turn-able plate, stripper and water spray unit.



Types CF are equipped with a cog-roller (for fish with a tough or thick skin) and types CS with knife- and cleaning-centrifuge (for fish with a soft or thin skin).

The band-models are suitable for large quantities and guarantee highest security during working - because they are switched off if the cover is opened. They have an adjustable pressure unit (opening height max. 90 mm), which adapts automatically to the filets and is available with different performance depending on the fish species (soft wheels, hard roller for salmon or soft balloon). With the band-machines the filets can be either skinned with stump blade or also with sharp blade. At skinning with stump blade (silver skinning) nearly no waste is generated, at working with sharp blade (deep skinning), the skinning depth can be adjusted from 0 to 5 mm.

Optionally, the band-models can be equipped with special designed curved blades, which allow in one working process to skin and remove the red-brown muscle segments along the sides of the sensory canal from fresh or smoked filets completely, which was one of the most difficult problems during normal skinning by hand. Additionally they have a removable charging belt, and a forwarding belt is available as accessories.

The following types are available as standard:

Model	Table-model		Stand-model		Band-model	
Type	CB300	CF420	CF460	CS460	CF495	CS495
Skinning wide mm	300	430	430	430	430	430
Skinning speed m/min	19	19	19	29	19	29
Width cm	50	70	82	82	70	70
Height cm	33	42	100	100	117	117
Depth cm	42	50	46	46	70	70
Motor kw	0.25	0.75	0.75	0.75	0.75	0.75
Weight kg	45	70	150	170	180	190

# PROCESSING

## Electric pressure chamber for smoking and grilling

Our implements are produced by modern machines and they are installed and approved accurately by hand. Due to continuing further development and in close cooperation with the leading professional institutes and associations of fish- and meat industry, as well as due to many suggestions from application in gastronomy, this devices are the most matured smoker, a fact that is confirmed by the best cooks all over the world, by many professional associations and last but not least by many foreign unions and professional hotel schools. These smokers with its approved technique are in operation worldwide. It is a product for specialty gastronomy as smoking is possible at any time in presence of the customer - also in food-shops, in the groceries-store, at the butchers, at the party-service, and beer-gardens etc.

In the electric pressure chamber griller and fumigator you can easily prepare hot or cold smoked specialities ready to serve within very short times. You can work with the oven in closed rooms - smoking indoors - always a pleasure. Fish and meat are not cooked directly by firewood or infrared heat, but indirectly by the hot air inside of the pressure chamber. The tightly closing door guarantees that only a very small amount of smoke and thus nearly no moisture leaks out. Proper gravy will be preserved, which is a great advantage in comparison to other smoking processes. Fish is put, with its belly up, onto the special grates. Flat-fish, fillet, meat are smoked on the flat grids. Flavour and proper gravy will remain. It cooks without addition of grease, therefore is low on calories. Constant temperature and optimal diffusion of smoke (pressure) will lead to a good cooking and a golden-brown colour of the smoked food. After the timer has run off, smoke will deposit on the inside of the walls. The darker they are, the better the taste will be. The special heat-resisting sealing of the doors needs neither maintenance nor renewal. Very low energy costs, over 60 % of cooking-terms you can grill and cook without electricity.



The double-casing insulation guarantees very short pre-heating times and very low energy consumption. All electric parts are protected. Both the interior and exterior of the smokers as well as pans and grates are made of stainless steel. It heats with thermostatic regulation and automatic timer. Switches and control lamps on the front side.

The smokers are delivered complete wit smoking- and drip-pan, 2-4 racks and 2-4 flat grids as well as manual with recipes.

The following types are available:

Type	HS 24	HS 48
Dimensions (WxHxD)	45x35x45 cm	45x35x85 cm
Racks and grids	30x40 cm	30 x 80 cm
Capacity max.	24 Fish - 7 kg Meat	48 Fish - 14 kg Meat
Weight	25 kg	45 kg
Connection 110/220 V	1 kw	2 kw

# PROCESSING

## Smoking cabinets for excellent product quality



With this smoker you will get a state-of-the-art and high-quality product finished through CNC-production, containing over 30 years of development and experience. Most remarkable features are simple operation and compact design. With our special integrated smoke-gas-guidance, your smoke goods will get evenly cooked and aromatized. With this you will get an optimal use of the smoke, the temperature inside the oven is very evenly and the dripping of condensate onto your goods is safely avoided.

These smokers are made of aluminium covered steel or stainless steel with interchangeable wood- or gas firing, for hot- and cold smoking of fishes as well meat etc. All smokers come complete with dry-drip-tub and bouncer. Grids, hooks, and pipes (130 mm diameter) are available as accessories.

Some of the available types:

Type	RS-20	RS-40	RS-100
Dimensions (WxDxH)	45x36x90 cm	45x36x115 cm	58x44x165 cm
Weight	25 kg	30 kg	80 kg
Capacity approx.	20 Fish or 12 kg Meat	40 Fish or 25 kg Meat	100 Fish or 75 kg Meat
Gas heater approx.	2.5 kw, 5 kg in weight	4.0 kw, 8 kg in weight	8.8 kw, 19 kg in weight
Propane gas use	approx. 185 g/h	approx. 290 g/h	approx. 640 g/h
Wood meal use approx.	250 g/Smoking	400 g/Smoking	700 g/Smoking

## Professional smoking ovens from stainless steel

This electrically (230/380 V/50 Hz) heated smoking devices have a capacity of 20-200 fishes (resp. 15-150 kg meat) per smoking time of 30-90 minutes. Precisely thermostat controlled heating (2.5-7.5 kw) produces heat and smoke for cooking slowly. A smoke pipe connection (120 mm), and the well double isolated (50 mm) walls and door prevents heat loss and makes curing possible also in closed rooms. The fish to be cured either be laid on the racks or hung on curing hooks on the racks. You will get best smoked-results by using pure beech or teak wood chips. They are available in different sizes. A build in pipe connection for an external smoke generator (for cold smoking) is available too. For a rational working, trolleys and ramps and some other accessories are available.





# PROCESSING

## Vacuum packing machines for food



At this table models the vacuum chamber and housing is made from stainless steel and the high transparent lid of acryl glass. An easy and automatic working process is possible through the analogue process time control pane (and from type "100" on also through the digital sensor control with 10 programs). The machines have a single sealing bar configuration (single time sealing-cutting system on request) and are also available with a double sealing bar configuration from type "200" onward. Gas injection system and soft-air ventilations are also possible from type "200" onward. The professional vacuum pump 230 V/50 Hz (vacuum time 10-60 seconds) and back ventilation guarantee a service friendly construction. Liquid insert-plate as accessory.

The following types are available as standard:

Type	Inside dimensions BxLxH mm	Outside dimensions BxLxH mm	Sealing bar Length mm	Pump m3/h	Power kw
Mini	280x310x80	317x438x293	280	4	0.6
Plus	280x310x120	317x438x293	280	8	0.8
Super	350x370x135	450x510x420	350	16	1.1
Jumbo	420x370x135	480x515x440	350	16	1.1
H-100	320x370x135	380x515x425	350	21	1.6
H-150	350x370x135	450x515x425	350	16	1.1
H-200	420x370x170	480x515x440	420	21	1.6
H-220	420x460x170	480x610x440	420	21	1.6

## Flake ice machines with or without storage container

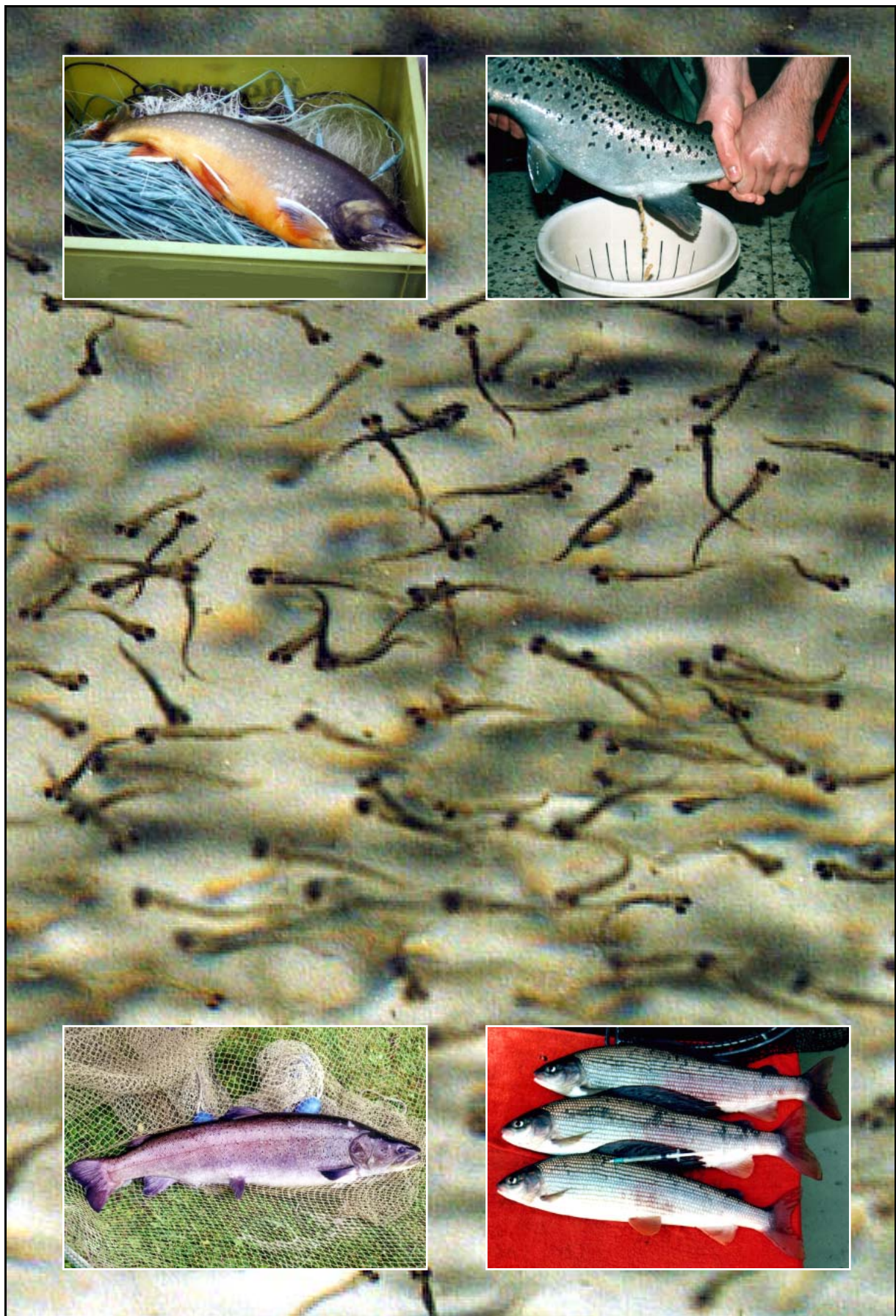
This scale ice makers are made of high quality stainless steel and plastics, have small dimensions and a high production capacity. They are easy to use and the innovative techniques guarantee a stable quality of the flake ice and are highly economic. All machines are FCKW-free (R 404 a), have adjustable feet and an automatic water remover. Other voltages, larger machines (also without refrigeration unit) or water cooled units on request.

As option a shift key for eligible ice temperature is available which allows producing ice with a temperature of either -8 °C or only -2 °C (ideally for fresh fish and seafood).

As accessories isolated storage containers for 70 to 900 kg ice are available, this keeps the ice cool and allow easy usage, even after longer storage. The 2 smaller units are also available with integrated storage container (40 mm isolated) for each 70 kg ice, where the ice machine is included above.



## OTHERS





# OTHERS

## Freshwater fishes with quality

We produce and deliver eggs, larvae, fry and fingerlings of various European freshwater fishes, like:

Whitefishes (*Coregonus lavaretus*):

Various populations and breeds are available. Suitable for stocking in lakes and dams. Systematic stocking of fry in large quantities proves to be most economic. Results achieved in practice have shown that in lakes, profits of up to 100 kg per hectare and year are possible.

Arctic Charr (*Salvelinus alpinus*) and Lake Trout (*Salmo trutta lacustris*):

The breeders origins from populations of alpine lakes. Suitable for stocking in alpine lakes, reservoirs and dams, as well as for the production of seafood. The fish are raised in illuminated submerged net cages with live zooplankton and therefore are extremely vital and of high stocking value. A high growth rate as well as an excellent meat combined with a nice colour and large sizes are main characteristics. Tests with tagged fish have shown that fingerlings of 3-5 cm is the most economic size for stocking, as the adaptation of much larger fingerlings to the lakes is more difficult.

Grayling (*Thymallus thymallus*) and Danube Salmon (*Hucho hucho*):

The breeders are caught in springtime in various rivers. Reproduction and raising of fingerlings takes place at the nursery farm on lake "Wallersee" with live zooplankton and later on also with dry food. Excellent results have already been achieved with restocking projects.

Pike (*Esox lucius*), Pike Perch (*Sander lucioperca*) and Burbot (*Lota lota*):

The breeders are caught in various lakes. Reproduction and raising of fingerlings with live plankton takes place at the nursery farm on lake "Wallersee". Stocking of fingerlings with 3-4 cm is most economic and is more as enough in most waters.

Sturgeons (*Acipenser baerii*, *Acipenser gueldenstaedtii*, *Acipenser ruthenus*):

After years of studies and experiments among most known sturgeon species and hybrids, now from our own brood-stock available –

Siberian Sturgeon (*Acipenser baerii*): An easy to keep sturgeon which is used mainly for aquaculture and caviar production (available from fertilized eggs to selected females).

Russian Sturgeon (*Acipenser gueldenstaedtii*): A beautiful sturgeon (light scutes on dark ground) which is well accepted as ornamental fish for garden ponds.

Sterlet (*Acipenser ruthenus*): A slow growing sturgeon which is mainly used for restocking (in the Danube River) and for the aquarium trade (albinos also available).

Beluga (*Huso huso*): The "Caviar fish" with the best growth rate, within 2 years a weight of up to 10 kg can be obtained with a water temperature of 20° C.

Paddlefish (*Polyodon spathula*): For the pond-culture, similar to the bighead-carp it is a plankton feeder and can be kept in polyculture with other sturgeons or e.g. with carps. The Paddlefish also delivers caviar.

We produce over 20 fish species during the year like: *Chondrostoma nasus*, *Barbus barbus*, *Silurus glanis* and other and we can also produce your required species.



## OTHERS

### Spawn- and foodstuffs for fish production

Carp Pituitary Extract, are acetone dried pituitary glands of carps, which are pulverized and can be used to speed up maturation (induced maturation) as well as the spawning process itself (induced spawning). Intramuscular injections are highly effective in increasing the incidence of spawning as well as possibly increasing egg take in certain species. The potential economic benefits of taking eggs earlier (or later) in a given season or in fact eliminating seasonality altogether in certain climates and regions are significant. Carp pituitary extract contains a variety of pituitary hormones, including gonadotropins, which are effective for the induction of final maturation and ovulation. CPE is administered in distilled water or physiological saline and injected intramuscularly at a dose of 1-10 milligram/kg fish. Available in vials of 1 gram (= 1000 milligram). In nature, reproductive development and spawning in finfish is controlled by environmental factors such as temperature, photoperiod, nutrition, water quality, and presence of spawning substrate. In aquaculture, it is not always possible or economically feasible to replicate natural conditions especially as many species are now grown some distance from their original geographic location. In the last decade significant research has been conducted worldwide on ripening fish sexuality using various preparations.

Brine Shrimp Eggs, are the dormancy-eggs (cysts) of *Artemia salina*, it is a kind of miniature shrimp (crustacea) which distribute widely and bear high sale. At present more than 500 Artemia producing areas in the world are known (such as America, China, Iran and Russia). These cysts may be conserved very long, and can be hatched as they are needed. The naupii hatch after 18-30 hours in warm (24-30 °C) salt water (1.5-3.5 % salt), and possess abundant protein and fat. Its grown-body holds high nourishment, so Artemia is an excellent food for various fish and crustaceans. Nutrition Analysis: Protein min. 45 %, Fat min. 15 %, Ash min. 6 %, Fiber max. 2 %, Moisture max. 8 %. They are available as "Premium Quality" in 425 gram (15 oz) cans (Net Weight), and 12 cans per case. Artemia is generally used for feeding the larval and postlarval stages of fish and shrimps. In contrast to crustacean larvae, marine fish larvae are cultured on Artemia for a much longer period of time (e.g.: 20 to 40 days). Artemia cyst consumption is also among the highest in marine fish larviculture and ranges from 200 to 500 g per 1000 fry produced.

Extruded Dry Food, with a reddish-brown colour and a well balanced fatty acid profile that promotes good appetite, fast growth, high survival and fish health. The extruded feeds are based on raw material of superior quality and are formulated as a starter and grower feed especially in closed water or recirculation systems, with minimal phosphate content and low nitrogen excretion. The particle sizes are also very stable in the water and hardly pollute it. The feed is highly energetic which guarantee very low feed conversion rates. It can be used from the first day on or as a replacement feed of brine shrimp and zooplankton "artificial plankton". It is suitable for the production of various fish species such as Salmonids, Percids, Acipenserids, Cyprinids and other species too. On request, larger pellets (6 or 22 mm), pigmented pellets (Astaxanthin 60 mg/kg) or floating pellets (2.5 and 4.5 mm) are available in 10-25 kg bags.

Additionally we deliver various disinfectants (Desamar, Chloramin, Virkon, etc.).

## Consulting and planning

An European-wide 25 years' experience and know how in the field of aquaculture, long-time cooperation with important scientific institutes and researchers, worldwide contacts and the experience-exchange on numerous international congresses and symposiums are the base of our respectable and successful consulting in management of waters and fish stocks, and in planning and construction of production systems, not only for freshwater but also for brackish- and seawater.

In cooperation, our team can offer:

### Natural waters –

Consulting for water management and creation of ecologic stocking plans. Accompany (also scientifically) on restocking-projects for fish, crayfish and mussels, etc. Settlements of fishing actions with electricity, seine- and gillnets in lakes and rivers. Analysing of plankton and fish populations in ponds and lakes etc.

Management of fish stocks in fresh- and seawater. Solutions at parasite problems, slow growing fish stocks or to low catch quotes. Suggestions for high catch compulsion. Catch of breeders, and re-production and rearing of autochthon and sense fish species and forms (also with zooplankton).

### Production systems –

Planning and design of farming and production systems for freshwater and marine fishes, as well as shrimps. Calculation and preparation of economy- and feasibility-studies, as well as water- and market analysis and project reports. Engineering for aquaculture and marine. Construction of hatchery-, nursery-, netcage-, recirculation- and docking-systems. Management and marketing for fish farms. Education and training of personnel for aquaculture and fishery.

We developed also a new economy-business plan model, based on a table calculation program (like MS Works, Excel or Lotus). You can enter all variables like: feeding rates and conversion factors, survival and selling rates, stocking density and tank sizes, prices etc. and it will calculate approximately forecast growth and stocks, investment and operation costs and all other requirements.

### Sturgeon publications –

The Sturgeons and Paddlefishes (Acipenseriformes) of the World: Biology and Aquaculture. By Martin Hochleithner and Jörn Gessner. Softbound, 248 pages. It is an illustrated English translation of the well known German book "Störe". This work is supposed to close the information gap between scientists and practitioners. It summarizes the current knowledge on all sturgeon and paddlefish species worldwide into a practitioner-oriented working guide, including the experience and research data of the authors.

The Bibliography of Acipenseriformes. By Martin Hochleithner, Jörn Gessner and Sergej Podushka. It is the most important bibliography about Acipenseriformes, which includes nearly all publications from around the world. Over 10000 references are listed alphabetically and cross indexed to species and headings. Available as electronic and searchable version (E-book on CD-ROM incl. Microsoft® Internet Explorer and Adobe® Acrobat Reader), or printed and bound version (book with over 500 pages).



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